

DEPRESSION AND DERAILMENT:
A CYCLICAL MODEL OF MENTAL HEALTH AND PERCEIVED IDENTITY CHANGE

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Kaylin Ann Ratner
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ABSTRACT

Derailment, or the sense that one has gotten “off-course” in terms of who they are and where they are going, has been nominated as a precursor to psychological ills like depressive symptoms. However, what the development of these depressive symptoms implies for continued feelings of derailment remains in question. The present study investigated a potential feedback loop between depression and derailment to explain how these two phenomena may persist through time. College students ($N = 939$, 63.6% female) were asked to take part in a preregistered, 4-wave longitudinal study over the course of one academic year. An autoregressive latent trajectory model with structured residuals was developed to test the bidirectional associations of these variables at the within-person level, asking whether deviations from one’s mean trajectory on depression can predict downstream deviations from one’s mean trajectory on derailment and vice-versa. Depression and derailment evidenced significant autoregressive stability from one wave to the next, and significant positive covariation within most waves. Depression was found to significantly and positively predict later derailment across all cross-lagged components of the model, thus supporting the hypotheses of the present study. Derailment was found to significantly and negatively predict depression in two of the three cross-lagged components, thus failing to support the hypotheses of the present study. Given some of these unexpected findings, results are discussed with an eye toward future work uncovering potential moderators of the association between derailment and resultant depressive symptoms.

BIOGRAPHICAL SKETCH

Kaylin Ratner is a graduate student in the Department of Human Development pursuing her Ph.D. in Developmental Psychology. Prior to attending Cornell, Kaylin received a Master of Arts degree from the University of Central Florida in Clinical Psychology. Kaylin's research activities, and the present thesis, are inspired by her previous experiences working with children and adolescents in acute psychiatric crisis. Specifically, Kaylin is interested in studying how mental health can shape one's sense of identity and purpose in life and, conversely, how one's sense of identity and purpose in life can dictate functional outcomes. After graduation, Kaylin hopes to pursue a career in academia so she can continue to study methods to optimize development for those struggling with their mental health.

To my cat, Molly. Thanks for putting up with me for the last nine years.

To my fiancé, Joseph Melnyk. I guess you're okay too.

To my brother, Richard Ratner. You're important.

To my grandparents, Gloria and Richard Milne. I love and miss you both.

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INTRODUCTION

Anyone who has experienced, or interacted with someone suffering from, depression can attest to its jarring nature. Indeed, there is empirical evidence to suggest that depression can significantly erode one's quality of life in a number of domains (e.g., Cotrena, Branco, Shansis, & Fonseca, 2016; Robb, Cooke, Devins, Young, & Joffe, 1997). Furthermore, a disruption in functioning as evidenced by impairment in social, occupational, and/or educational arenas is specified as a necessary criterion in Major Depressive Disorder's diagnostic taxonomy (American Psychiatric Association [APA], 2013). The study of depression has been a dominant force in both medical and psychological contexts dating back to when it was first described as an excess of "black bile" (Bynum & Porter, 1993) by Hippocrates (460-377 B.C.). To date, clinical literature has outlined a number of aspects of depression including its biological catalysts, environmental activators, and cognitive and neurological signatures. For as much as we know about what gives rise to and maintains the experience depression, we know comparatively little about how it interacts with global psychological processes. Consequently, insight into how depression relates to perceived self-change over time remains out of view.

Perceiving stability in who one is and where they are going is vital for psychological health and flourishing (e.g., Ball & Chandler, 1989; Berman, Weems, & Stickle, 2006; Côté, 1997; Erikson, 1950, 1968; Zaff & Hair, 2003). But to what extent might depression interrupt an individual's experience of stability in their sense of self and self-direction? A concept known as *derailment* describes such perceived instability and, not surprisingly, has been linked with a host of maladaptive correlates including increased depressive symptoms, stress, and anxiety (Burrow, Hill, Ratner, & Fuller-Rowell, 2017). Given the negative consequences for those grappling with

experiences as disruptive as depression and derailment, the need for research to better understand how these constructs function is clear. To this end, researchers have made calls for greater empirical intersectionality by beginning to integrate theories from clinical psychology with broader perspectives on human development (e.g., Kaufman, Montgomery, & Crowell, 2014). Answering this call and contributing to this emergent crossroad, this thesis will explore how derailment and depression are related to one another over time.

First, theoretical evidence will be reviewed in an attempt to more fully explain derailment's capacity to prospectively predict depressive symptoms (as purported in Burrow et al., 2017). Second, research concerning the influence of mental health on cognition and self-perception will be discussed. Finally, it will be argued that depression may be able to similarly forecast one's sense of derailment downstream. Within this final argument, a cyclical association between depression and derailment will be proposed. This reciprocal pattern between depression and derailment will then be modeled and tested in an attempt to explain how these processes jointly exist through time.

Like any complex human experience, however, the proposed relation between depression and derailment must take place within a given setting. Although this bidirectional association could likely manifest during any stage of life, the transition to and through college represents a unique period in the lifespan when identity-related questions, or questions about who we are and where we are going, are of immediate salience (Arnett, 2000, 2004; Azmitia, Syed, & Radmacher, 2008; Waterman, Geary & Waterman, 1974; Waterman & Waterman, 1971). Furthermore, coinciding with the undertaking of new personal, social, and academic responsibilities, the transition to college is often marked by high levels of stress that might put some at risk for the development of clinically-significant disorders like depression (e.g., Compas,

Wagner, Slavin, & Vannatta, 1986). As such, studying the association between depression and derailment might be best-suited for those embarking on the bridge from late adolescence to early adulthood due to the challenges endemic to this cohort. Relatively speaking, the transition to college occurs rather early in the lifespan and can set the course for the rest of one's life. If evidence can be provided for the mutual influence of depression and identity-relevant processes on one another, it might be the case that future researchers, educators, and practitioners may be better-equipped to help address potential threats to college completion, personal development, and continued well-being. Theoretical and empirical investigations of this non-recursive model during the transition to college not only has implications for how we conceptualize depression and the relation between perceived self-change and mental health, but also how we move forward with treatment for those who are affected by one (or both) of these phenomena. Thus, this information could one day be used help bolster functioning and promote positive development throughout the lifespan.

REVIEW OF THE LITERATURE

Derailment

Drawing upon literature describing the interplay between identity and self-direction (e.g., Çili & Stopa, 2015; Peetz & Wilson, 2008), derailment manifests a series of self-relevant beliefs that describe the subjective feeling that one has somehow gotten off-course (Burrow, Hill, Ratner, & Fuller-Rowell, 2017). First, a highly derailed individual may believe that a past identity has been lost and, perhaps, replaced by a new one. That is, derailment may result from feeling as though *who one is* has changed. Second, individuals who sense derailment may believe that their current motivations in life and self-direction are incompatible with pursuits of the past. Therefore, derailment also represents the subjective sense that *where one is going* and *why* have changed. Third and finally, derailment may entail a perceived lack of ability (or willingness) to reconcile how a past identity has evolved into a current. It is important to note that, derailment is not dissociative in the sense that one denies temporally-distinct identities; rather, derailment represents a keen awareness of identity-relevant loss, and a failure to sense how one's current path connects meaningfully to one's past.

Associated Features of Derailment and Functional Outcomes. Derailment can be distinguished from conceptually similar constructs, like self-continuity (e.g., Chandler, 1994; Sedikides, Wildschut, Routledge, & Arndt, 2015), in a number of ways (Burrow et al., 2017). First, typical methods of measuring concepts such as self-continuity, identity, and self-concept rely on objective change markers that ask individuals to rate themselves on various dimensions at different points in time or across different situations (e.g., English & Chen, 2007). While valuable to developmental science, such approaches fail to capture whether or not individuals actually *feel* like they have changed given that objective experiences do not necessarily have a

subjective corollary (Beck, 1974; Dobson & Dozois, 2010). Further inflating possible errors caused by relying solely on objective markers of change, Burrow and his colleagues (2017) assert and demonstrate that the negative effects of feeling derailed do not depend on the quantitative number of stressful life events (c.f., Holmes & Rahe, 1967) one has experienced. No matter the number of life events someone has experienced, feeling as though one is off-course appears related to increased stress, anxiety, and depressive symptoms. As such, derailment has earned a place as a continuous individual difference that varies widely based on an individual's subjective perception of the continuity of their life course.

A second nuance of derailment is that it may have deleterious effects regardless of the valence of one's perceived change. Indeed, there is evidence that derailment continues to be related to negative outcomes regardless of whether an individual feels they have changed for the better or worse. Such a phenomenon is to be expected, as psychological equilibrium is prized (Holmes & Rahe, 1967). It is important to note, however, feeling as though one has changed for the better appears to attenuate the consequences of perceived self-change, especially when compared to those who feel as though they have changed for the worse (Keyes, 2000; Keyes & Ryff, 2000; Molouki & Bartels, 2017). Earlier literature has found perceived self-stability to be the most adaptive psychological precursor relative to perceived self-instability, regardless if that felt change is positive *or* negative (Keyes, 2000), thus, providing credence to this preliminary evidence pointing to derailment's robust negative implications.

Finally, and perhaps most relevant to the present study, is derailment's long-term predictive utility. In addition to being negatively correlated to a number of well-being markers (e.g., hope, life satisfaction, identity commitment) and positively correlated with indicators of dysfunction (e.g., negative affect, stress) cross-sectionally, in a one-year longitudinal study,

derailment has been identified as a unique predictor of depressive symptomatology above and beyond other known risk factors for negative affectivity and depressive symptoms (e.g., Big 5 personality traits; Burrow et al., 2017). Thus, it is clear that sensing self-instability and discontinuity in one's life are a key factors in psychological malaise and overall dysfunction (Ball & Chandler, 1989; Keyes, 2000; Keyes & Ryff, 2000).

Presently, individual risk factors for feeling derailed have yet to be thoroughly mapped. Although the effects of sensing derailment appear to be mute to objective number of life events, the evidence to date does not preclude the possibility that certain experiences can differentially predict the experience of derailment. This thesis nominates depression as a qualitatively unique type of life experience that can influence one's sense of self-continuity. In the next section, I delve into, and attempt to explain, past evidence for derailment as a risk factor for later depression, thus, helping to establish the first pathway in the proposed bidirectional model.

Why might Derailment predict Depression?

If the association between depression and derailment is indeed cyclical, then an argument must be made for the mechanisms behind why derailment can anticipate later depressive symptoms as evidenced in Burrow and colleague's (2017) longitudinal study. First, several perspectives are presented to dive further into *why* derailment may inform subsequent depressive symptoms.

Cognitive Distortion Parallels. Among the most popular theories of how depression emerges and is maintained are distinct thinking styles known to negatively color cognition. Aaron Beck (1967, 1974, 2008) coined the term "cognitive distortions" and "common cognitive errors" to describe systematic biases present among the accounts of those living with depression (p. 280; DeRubeis, Webb, Tang, & Beck, 2010). These errors include "all-or-nothing thinking,"

“overgeneralizing,” “discounting the positives” (also known as “filtration”), “jumping to conclusions,” “mind reading,” “fortune telling,” “magnifying/minimizing,” “emotional reasoning,” “making ‘should’ statements,” “labeling,” and “inappropriate blaming.” Albert Ellis (1985) had a very similar set of maladaptive thinking styles that he believed always extended from a process he playfully deemed “*musterbation*.” When individuals *musterbate*, they tend to engage in dogmatic thinking styles where things should (or should not), ought (or ought not), or must (or must not) happen. Further, Ellis believed that individuals who engaged in irrational thinking styles also asserted the “I-can’t-stand-its” wherein patients with depression display a profoundly low level of frustration tolerance, or general ability to deal with events when they take an unexpected turn. The irrational thinking styles identified by Ellis are distilled down to the most common by Dryden, David, and Ellis (2010): “Dichotomous thinking,” “negative nonsequiturs” (also known as “jumping to conclusions”), “fortune-telling,” “focusing on the negative,” “disqualifying the positives,” “allness and neverness,” “minimization,” “emotional reasoning,” “labeling and overgeneralization,” “personalizing,” and “perfectionism.” Many cognitive distortions are thought to occur simultaneously, and clients may be displaying several different errors in a single instance (as seen in Bernard, 1991).

Given the amount of overlap between the maladaptive thinking styles described by both Beck (1974) and Ellis (1985), it may be beneficial to consider them concurrently in terms of derailment. First, and perhaps most strongly, derailment seems to be a manifestation of the “emotional reasoning” distortion. Beck (1974) suggests that emotional reasoning occurs when individuals erroneously believe that because something *feels* like it is true, it therefore *must* be true. As such, derailment may be a manifestation of emotional reasoning because it can become quite deeply ingrained in an individual that because certain characteristics of themselves have

changed (e.g., they have “matured,” stopped practicing certain beliefs, stopped engaging in certain activities), they feel like a different person and *therefore they are a different person*. This emotional reasoning could drive the severance of temporal identities, resulting in a sense of derailment. From Ellis’ view of emotional reasoning, if one feels as though they have changed, it *must* also be true. If they have changed for the worse, they have become *a total failure* and they *cannot stand it*. This series of beliefs might then give rise to subsequent feelings of dysphoria as noted in Burrow et al. (2017).

Second, derailment may also be construed as a manifestation of the “all-or-nothing” or “dichotomous” thinking styles described by both Beck (1974) and Ellis (1985). In short, all-or-nothing/dichotomous thinking occurs when people engage in categorization of events, feelings, or even selves. Individuals who believe they are better or worse than a past iteration of the self may feel disconnected from this self because of the parsing out which occurs under categorical thinking conditions. A highly derailed individual may be engaging in all-or-nothing thinking in that they may believe that they are *either* entirely the same or entirely different – there is no shade of gray. This disconnect represents the third cognitive belief found among those most likely to report high levels of derailment (Burrow et al., 2017). Moreover, individuals who are experiencing derailment may also believe that because they are not pursuing the same goals or ideologies as they once were, their new ideologies are inherently incompatible with their old ideologies. For example, an individual who started college as a medical student may not be able to find the connection to a past identity if they change career paths toward law or art because they view these paths as mutually exclusive. Furthermore, elaborating on Ellis’ view of dichotomous thinking, if an individual with high academic identity centrality, for example, receives a failing grade on an exam, it means that they are a *total failure* and this could very well

be the start of an individual sensing derailment (i.e., “I was an A-student – now I am a *total failure* because I failed one exam. I’m going from being a medical student to a janitor. Medical students *are perfect* and *never* fail exams.”).

Third and finally, one might argue that derailment is a manifestation of making “should” statements (Beck, 1974) and engaging in broad *musterbative* tendencies (Ellis, 1985). Individuals who become derailed might feel as though a part of themselves has been lost (and that *should not* have occurred) or that a piece of themselves *should not* be a part of their sense of identity any longer. Similarly, individuals may feel as though they *should* or *should not* have become something. As such, these individuals may long for this piece of themselves which they believe is missing or, conversely, distance themselves from the piece that they feel no longer belongs. In both scenarios, a gap is created between an idealized self and the actual self. Feelings of personal estrangement may then arise, and this may manifest as derailment’s third cognitive component (temporal disconnection). Furthermore, in the Derailment Scale (Burrow et al., 2017), an exemplary item reads “I am surprised at who I have become.” If one is surprised by something, it could reasonably be argued that they did not expect it. In saying that one is surprised at who they have become, a message underlying that statement could be, “I *should not* have become this” or “this *should not* have happened.” This surprise could be either positive or negative in nature, but in any case, this track is not something that the individual anticipated and this could signal a disruption in continuity. For example, an individual who fails organic chemistry might feel as though they *should* have become a doctor. As a consequence, this individual’s identity as a medical student drifts farther and farther away and this might be quite unexpected (i.e., “this *should not* be occurring”). Compounding with all-or-nothing thoughts, the individual sees medical school and their new path (e.g., engineering, psychology) as two separate camps that

cannot be reconciled (i.e., “these two things *should not* go together”) and discrepant pathways may then emerge and spur or maintain depressive symptoms.

Given these parallels between derailment and other well-known errors of cognition, it is possible that derailment may simply be an unexplored cognitive distortion. If true, derailment may function (at least in part) as a cognitive mechanism that establishes and maintains depressive symptomatology.

Evidence from Interpersonal Psychotherapy. Erikson theorized identity as a psychosocial process (Erikson, 1968) – it is developed in a social space for the purposes of helping an individual function within a social community. Modern theorists have asserted many ways that individuals work toward establishing a sense of identity, but one’s roles in life appear to be among the richest sources of self-relevant information (see Hill & Cardador, 2015; Thoits, 1983; 2012). Indeed, how individuals view themselves relative to their social context serves as a way for an individual to create a concrete senses of identity and self-direction. It is reasonable then to assume that these life roles figure prominently in psychological health vis-à-vis their identity- and purpose-engendering nature.

That being said, role *transitions* have also been identified as depressive triggers in popular, empirically-supported theories of psychotherapy. Namely, within an interpersonal psychotherapy framework (IPT; Klerman, Weissman, Rounsaville, & Chevron, 1984; Weissman, Markowitz, & Klerman, 2007), it is theorized that difficulty adjusting to positive or negative life changes (e.g., becoming a mother, losing a job, getting divorced) explains why some individuals find themselves in the midst of a depressive episode. Therapeutic goals within the IPT framework focus on helping individuals gain the interpersonal skills necessary to cope with one’s new role and to process/mourn the loss of one’s old role so that healing and adjustment can

take place (Verdeli & Weissman, 2011). If one's roles in life give rise to their senses of identity and self-direction, and derailment is the result of feeling as though one's identity and self-direction have changed, perhaps it is the case that IPT's theory of depressive onset could provide some groundwork for why Burrow and colleagues (2017) found evidence for derailment's deleterious nature in predicting depressive symptoms one-year downstream. Among several directions available for the study of derailment, its association to perceived role transitions represents a plausible hypothesis and fallow area for future investigation.

Evidence from Persistent Complex Bereavement Disorder. Evidence for how changes in identity can disturb mental health can also be illustrated by examining how derailment might “fit” into other depressive-like phenomena. In Section III of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; APA, 2013), “conditions for future study are proposed” (p. 789) with the hope of generating enough research to substantiate the bids as actual disorders in future iterations of the DSM. The construct of Persistent Complex Bereavement Disorder (PCBD), otherwise studied as “complicated grief” (Prigerson et al., 2009; Simon, Wall, Keshaviah, Dryman, LeBlanc, & Shear, 2011), is one such recommendation. Grief is a normative, understandable response to death and, following the diagnostic criteria of Major Depressive Disorder in the DSM-5 (p. 160-161), a cautionary note is made about diagnosing depression in cases of individuals who are reacting to the recent loss of a loved one (APA, 2013). Although the DSM-5 outlines how grief and depression are different (see also Robinson & Fleming, 1989; Wijngaards-de Meij et al., 2005), it is indeed possible to develop clinical depression during or after such a profound loss occurs (Harrison & Harrington, 2001; Maccallum, Galatzer-Levy, & Bonanno, 2015).

In the proposal for PCBD (APA, 2013), it is specified that symptoms must be persistent for at least twelve months following the death of someone with whom the individual had a close relationship. In addition to intense sorrow, longing for the deceased, and preoccupation with the deceased and the circumstances of their death, PCBD is particularly striking because at least six additional symptoms from two different clusters (“reactive distress to death” and “social/identity disruption”) must be present in addition to one of the aforementioned broad grief symptoms. While “reactive distress to death” might represent an affective (e.g., bitterness), cognitive (e.g., self-blame), or behavioral (e.g., avoidance) change following the death of a loved one, “social/identity disruption” appears more interpersonal and existential in nature. Captured under this category of “social/identity disruption” (p. 790) is the possibility of an individual feeling or experiencing (1) an intense desire to die in order to reunite with the deceased; (2) trouble with trusting others following the death; (3) marked loneliness or detachment from others since the death; (4) emptiness, meaninglessness, or inability to function without the deceased; (5) loss or confusion regarding one’s role in life or attenuated sense of self (e.g., “a piece has died”); or (6) decreased future-orientation (e.g., difficulty making plans or desertion of goal pursuits).

These long-lasting changes in experience, especially with regard to one’s sense of self and interpersonal functioning following loss (Prigerson et al., 2009; Simon et al., 2011), might suggest that death of a loved one has the capacity to be quite “derailing” in nature. Indeed, early research has suggested that identity is a role-based phenomenon (e.g., Thoits, 1983) and when individuals are removed from certain roles, distress is incurred and well-being, purpose, and meaning in life are attenuated (Thoits, 2012). As such, the theoretical dots here could be connected in such a way to suggest that certain poignant experiences (especially those that impact one’s life roles) could make some individuals feel as though their identity and life course

have been disrupted. In turn, these intra- and interpersonal losses could set the stage for ongoing distress and difficulties with adjustment.

Flipping the Arrow: Mental Health can Shape Sense of Self and Self-Direction

The argument for mental health's ability to meaningfully predict perceived changes in identity is at the crux of this thesis because it completes the cyclical model between depression and derailment. This argument begins with a bird's eye view, discussing how various forms of psychopathology may affect how one thinks about themselves, and ends with the specific ways that depression could reasonably give rise to perceived identity-related changes before delving into the hypothesized depression-derailment effect.

A Social-based Perspective. As noted above, Erikson (1950, 1968) postulated that identity serves as a means for helping individuals navigate into a social niche. In various explorations of mental health and the social context, movements such as “Pro-Ana” and “Pro-Mia” (web-based communities dedicated to the support and encouragement of eating disorders; Csipke & Horne, 2007; Norris, Boydell, Pinhas, & Katzman, 2006) and blogs for individuals engaging in non-suicidal self-injury (NSSI; Whitlock, Powers, & Eckenrode, 2006) have emerged. On these websites, users with disordered eating and NSSI behaviors tend to find their lifestyles normalized, supported, and perhaps even reinforced by a community of like-minded users (e.g., Lewis & Baker, 2011; Lewis & Seko, 2016; Lewis, Heath, Sornberger, & Arbuthnott, 2012; Tong, Heinemann-LaFave, Jeon, Kolodziej-Smith, & Warshay, 2013). In doing so, individuals may begin to develop a sense of identity that is connected with this community and these maladaptive behaviors (Adams, Rodham, & Gavin, 2005; Adler & Adler, 2008; Giles, 2006; Riley, Rodham, & Gavin, 2009). These platforms then may be especially appealing to psychologically vulnerable individuals, especially in light of emerging correlational evidence

suggesting that both self-harm behaviors (Breen, Lewis, & Sutherland, 2013; Claes, Luyckx, & Bijttebier, 2014) and eating disorders (Stein & Corte, 2007) are significantly and positively associated with unresolved identity negotiations.

Second, extending this discussion of how mental health may shape identity as a result of social forces, identity may also be impacted by one's ecological environment. Early theories have recognized the potential for mental illness to become a part of one's social identity (Thoits, 1985). And, just like many marginalized groups, individuals with mental illness have traditionally been stigmatized and discriminated against (e.g., Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999). The Rejection Identification Model (RIM; Branscombe, Schmitt, & Harvey, 1999) purports that when rejection is felt based upon group membership, identification with that group becomes more important. That is, discrimination tends to prompt individuals to think about themselves in terms of, and as a part of, a marginalized status. Contrary to what may be expected, research on the RIM with ethnic minorities (e.g., Branscombe et al., 1999) and the physically disabled (e.g., Fernández, Branscombe, Gómez, & Morales, 2012) demonstrates that this increase in identity centrality typically results in an increased defense against stigmatization by way of increasing one's sense of belonging to a given group. As such, the RIM serves as a mechanism that may explain how individuals who face discrimination are able to maintain a sense of well-being and advance toward psychological flourishing despite daily negative social experiences. With this said, however, the RIM does not appear to sustain in cases of mental illness, namely, depression (Cruwys & Gunaseelan, 2016). Cruwys and Gunaseelan's preliminary evidence seems to suggest that individuals with depression received a "double whammy" because they are (1) at risk for discrimination based on their belonging to a stigmatized group and (2) cannot reap the noted buffering effects of the RIM as a result of

increased illness identity centrality. Furthermore, individuals who deflect a mental illness identity tend to experience less distress and higher positive affect than those who endorse it, even after accounting for treatment history, disorder severity, degree of impairment, and several other demographic indicators (Thoits, 2016). As such, individuals who develop a mental health concern such as depression might begin to think about themselves a little differently as a result of external feedback about one's place relative to other social groups.

A Cognitive-based Perspective. Some researchers view identity as a strict function of temporal cognition – that is, one must remember who they are, as well as their associated experiences, in order to create a stable sense of identity (Addis & Tippet, 2008; Conway, Singer, & Tagini, 2004). This is perhaps most evident in studies of identity attenuation among individuals with Alzheimer's disease (e.g., Addis & Tippet, 2004). Furthermore, past and future thinking are highly related, both in terms of neural substrates (e.g., Okuda et al., 2003) and mechanistic properties (Addis, Wong, & Schacter, 2007; Schacter & Addis, 2009), and it is hypothesized that the two temporal thinking styles work together to create a comprehensive sense of self (Çili & Stopa, 2015; D'Argembeau, Lardi, & Van der Linden, 2012; Peetz & Wilson, 2008). Stated differently, it appears that where we are going and where we have been feeds into one's sense of self in the present moment which, in turn, helps to cultivate a sense of identity and self-continuity. Mental illness, however, has been shown time and time again to disrupt processes related to temporal thinking – both past and future (e.g., Boulanger, Lejeune, & Blairy, 2013; D'Argembeau, Raffard, & Van der Linden, 2008; Kramers, Spinhoven, Van der Does, & Van Dyck, 2006; Lind & Bowler, 2010; Maccallum & Bryant, 2011).

Depression, Cognition, and Impact on Identity. A disturbance in thinking characterizes several theories of the onset and maintenance of depression, as well as treatment intervention

(e.g., Beck, 1974, 2008; Disner et al. 2011; Ellis, 1962, 1985; Lazarus, 1976). In Beck's (1974, 2008) cognitive model of depression, it is hypothesized that genetic vulnerability (diathesis) and environmental triggers (stressors) give rise to dysregulated/negative schemas (ideas about the self, constructed from experience). These negative schemas about the self then lead one to engage with the environment through a biased lens of attention, processing, and memory retrieval. This, in turn, gives rise to reported depressive symptoms (Disner et al. 2011; Dalgleish & Werner-Seidler, 2014). With regard to attention, it seems that individuals with depression tend to be more attentive toward stimuli that are consistent with their current mood (Gotlib, Krasnoperova, Yue, & Joormann, 2004; Kellough, Beevers, Ellis, & Wells, 2008), thus, impairing their ability to escape from negative situations and/or focus on positive things that might improve their mood. Working alongside biased attention toward negative stimuli is biased processing whereby positive experiences tend to elicit weakened dopaminergic responses in individuals who are affected by depression, thus, dissuading them from continuing to pursue pleasurable activities (e.g., Pizzagalli et al., 2009; Tremblay et al., 2005) and increase the frequency of positive affect/reward.

Perhaps most pertinent to the discussion of how depression may shape cognition and identity is literature revealing the unique memory styles of individuals in the midst of a depressive episode. Individuals with depression tend to outperform controls on tasks asking participants to recall unpleasant memories (Lloyd & Lishman, 1975) which is in contrast to healthy controls, who tend to recall pleasant memories faster than unpleasant memories (Lishman, 1974). This point is particularly salient, as this phenomenon appears to both bias and disrupt the recollection of autobiographical memories in patients who present as depressed (Dalgleish & Werner-Seidler, 2014). In particular, individuals suffering from depression appear

to engage in a cognitive style known as overgeneralization whereby memories are recalled in terms of categories that lack detail and specificity (e.g., “High school dances” vs. “My senior prom,” where the former demonstrates an overgeneralized memory rather than a discrete event; Williams et al., 2007). To discuss broadly and briefly, Williams and his colleagues postulate that overgeneral memory occurs in individuals suffering from mood disturbances due to (1) functional avoidance of specific material that may be upsetting to remember, (2) the particular propensity for individuals to stagnate in “capture errors” that are self-referential (given the negative schemas underpinning depressive symptomatology), and (3) an impoverished ability to override these systems due to (e.g., Dagleish et al., 2007; Gotlib et al., 2004) declines in executive control capacities when in a depressive episode.

Although thinking about the past has significant implications for one’s sense of identity (e.g., Peetz & Wilson, 2008), the effects of overgeneral memory ripple beyond simply thinking about this end of the temporal vector (i.e., the past to present self). In studies of adults with and without depression, overgeneral memory processes are negatively associated with specificity of future thinking (Williams, Ellis, Tyers, Healy, Rose, & MacLeod, 1996) and goals (Belcher & Kangas, 2014). Keeping with the theme of future-orientation, it has been found that vividness has significant implications for both empathy and prosociality (Gaesser & Schacter, 2014). These processes are important to this thesis because both characteristics have systematically been related to the development of identity (Busch & Hofer, 2011; Hardy & Kisling, 2006) and identity-related processes like finding purpose in life (Damon, Menon, & Bronk, 2003). As a result of these overgeneral processes, the types of (1) memories recalled and (2) future events generated by individuals with depression are distorted. Accordingly, these biased patterns of thinking may have ramifications for the shaping of identity and self-direction.

Situating Derailment within the Purview of Depression

Symptom Parallels. From the review above, it is clear that identity may be informed by both social and cognitive forces, and these forces may have the capacity to then interact with the status of one's mental health. These proxy associations with identity serve as temporary foundation upon which an argument for bidirectionality between depression and derailment may be built. In attempting to construct this argument, it may be useful to scrutinize the potential relationship criterion-by-criterion from a theoretical framework (see Table 1).

Starting with overarching features of Major Depressive Disorder, the DSM-5 (APA, 2013) explicitly states in Criterion A of the disorder that the cluster of symptoms, present for at least 2 weeks, must "...represent a change from previous functioning" (p. 160). As such, it is a requirement of the disorder to experience some significant change from baseline. Furthermore, speaking to the subjectivity of developing depressed symptoms (and of derailment), this shift also *must* be subjectively felt by the patient or else later criteria (i.e., "significant clinical distress," p. 161) cannot be satisfied.

Table 1. *Depressive Symptoms may Initiate or Exacerbate Identity-Related Changes*

Criteria for Major Depressive Disorder ¹	Corollary Disruptions in Identity which may Lead to Derailment
Predominant feelings of sadness, emptiness	Change in baseline mood may give rise to perceived changes in self-concept/label. Adoption of a colloquially-understood mental illness identity may occur – “I am depressed.” ^{1, 2, 32, 33, 34, 35, 36}
Anhedonia	Difficulty engaging in, or total disengagement from, personally expressive activities as a result of basic reinforcement mechanisms ^{3, 4, 5, 6, 27}
Weight loss/gain	Change in physical structure may give rise to change in sense of identity, may cause shifts in romantic or social relationships, or physically limit ability to engage in eudaimonic activities ^{7, 8, 27, 28}
Insomnia/hypersomnia	Changes in cognitive functioning as a result of sleep deprivation which lead to difficulties in executive functioning, and/or force disengagement from pleasurable activities because of increased sleeping ^{9, 10, 18}
Psychomotor agitation/retardation	Change in capacity to execute pleasurable or personally-expressive activities (e.g., drawing) ^{11, 12}
Fatigue, loss of energy	Decreased sense of personal agency. May impair ability to engage with social others, typical daily life, or personally expressive activities ^{9, 13, 14}
Feelings of worthlessness, guilt	Loss of identity-related constructs like self-esteem and meaning in life ^{13, 15, 24, 26, 30, 31}
Difficulty concentrating, forgetfulness, indecisiveness	Difficulties with autobiographical memory retrieval affect construal of identity, difficulties with executive control (e.g., planning, goal-setting) affect self-direction and purpose in life ^{16, 17, 18, 19, 20, 21}
Thoughts of death, suicidality	Associated with disrupted sense of self-continuity – impoverished ability to recognize how present self is connected to future self. Failure to see self in future is an inherent change of direction ^{22, 23, 29}

Notes: ¹ (APA, 2013); ² (Cruwys, & Gunaseelan, 2016); ³ (Pizzagalli et al., 2009); ⁴ (Waterman, 2011); ⁵ (Steger, Kashdan, & Oishi, 2008); ⁶ (Skinner, 1953); ⁷ (Sukhanova & Thomashoff, 2015); ⁸ (Paap & Gardner, 2011); ⁹ (Jennum, Ibsen, Avlund, & Kjellberg, 2014); ¹⁰ (Fortier-Brochu, Beaulieu-Bonneau, Ivers, & Morin, 2012); ¹¹ (Sabbe et al., 1999); ¹² (van Hoof, Hulstijn, van Mier, & Pagen, 1993); ¹³ (Dickson, Knussen, & Flowers, 2008); ¹⁴ (Larun & Malterud, 2007); ¹⁵ (Beaumont & Scammell, 2012); ¹⁶ (Peetz & Wilson, 2008); ¹⁷ (Dalglish & Werner-Seidler, 2014); ¹⁸ (Dalglish et al., 2007); ¹⁹ (Belcher & Kangas, 2014); ²⁰ (Gaesser & Schacter, 2014); ²¹ (Williams et al., 1996); ²² (Ball & Chandler, 1989); ²³ (Chandler, 1994); ²⁴ (Piotrowski, 2013); ²⁵ (Brewer, 1993); ²⁶ (Sowislo & Orth, 2013); ²⁷ (Ames & Leadbeater, 2017); ²⁸ (Mehlenbeck, Farmer, & Ward, 2014); ²⁹ (MacLeod & Conway, 2007); ³⁰ (Shahar & Davidson, 2003); ³¹ (Scheier et al., 2006); ³² (Hogg, 2011); ³³ (Thoits, 1985); ³⁴ (Thoits, 2016); ³⁵ (Moses, 2009); ³⁶ (Coyne et al., 1998)

Depression is also a highly publicized disorder, and its hallmark symptoms have been found to be highly recognizable, even by lay observers (Hogg, 2011). Given its resounding presence in both professional and non-professional circles, it is reasonable to conclude that an individual, who feels a marked negative change in mood, might come to colloquially self-diagnose as “depressed” regardless of clinical thresholds. Indeed, self-labelling processes are observed in clinical populations (Moses, 2009; Thoits, 1985, 2016). In doing so, individuals with mental disorders may begin to self-identify as being a part of a stigmatized group of those who are mentally ill (e.g., Link et al., 1999). This inclusion may result in increased salience of illness-related identity via the RIM model discussed earlier (Branscombe et al., 1999) and changes in self-perception (Cast & Welch, 2015; McGrath & Repetti, 2002). As a result of this identification with a marginalized group, individuals who identify as depressed may experience subsequent negative impact on well-being (Cruwys & Gunaseelan, 2016; Thoits, 2016). Provided with this evidence that both emotions and felt inclusion in a stigmatized group can bring about perceived changes in self (i.e., increased identity salience and a shift in self-perception), an argument for significant perceived changes in identity (or, at the very least, self-concept) is present.

Next, the depressive symptom of anhedonia may significantly account for changes in both identity and self-direction. Anhedonia, as described in the DSM-5 (p. 160; APA, 2013), is a “markedly diminished interest or pleasure in all, or almost all, activities... (As indicated by either subjective account or observation).” This feature of depression is particularly important because engagement in certain activities has been tied to role-based identity and purpose development (e.g., Hill & Cardador, 2015; Thoits, 1983, 2012). When an individual begins to experience anhedonia, pleasure received from activities diminishes and basic reinforcement

mechanisms would suggest that if positive reinforcement is no longer being received, extinction of the behavior will occur (Skinner, 1953). Anhedonia, therefore, may cause a person to disengage from previous activities that they may have found to be personally expressive or eudaimonic in nature (see also eudaimonic identity formation; Waterman, 2011). When these identity- and purpose-informing activities are no longer part of one's repertoire, shifts in identity and/or purpose may occur depending on their centrality to one's identity (Thoits, 2012). For example, if playing basketball was a personally expressive activity for an individual, but they stop playing basketball because they "no longer find it fun" (as a result of depressive symptoms like anhedonia), that individual's athletically-based identity may begin to wane. Similarly, is a writer still a writer if they no longer write? While it is hoped that new activities may help people maintain a sense of eudaimonia, as noted in the biological features of depression, reward responses are significantly attenuated in brains affected by the disease (Disner et al. 2011; Pizzagalli et al., 2009) thus decreasing the likelihood of "picking up" new activities that could bring about fulfillment. This disengagement from activities is inherently a change and, therefore, a possible conclusion is that individuals may feel that they are no longer an identity associated with that given activity (e.g., "I am no longer a basketball player or athlete") that may have been highly identity-salient.

Although anhedonia may represent the most direct and salient argument for depression leading to disengagement from personally expressive activities, other symptoms of depression may similarly lead to changes in lifestyle. Other symptoms of depression that may be responsible for cultivating such changes could include weight/loss or weight gain, changes in sleeping patterns, issues with movement, and overwhelming fatigue. First, changes in weight may dictate how one spends their time. For example, changes in weight may significantly impact one's social

or romantic functioning (e.g., Ames & Leadbeater, 2017; Mehlenbeck, Farmer, & Ward, 2014; Paap & Gardner, 2011) and individuals with difficulty forging social connections have been shown to struggle with consolidating a sense of self (Ratner & Berman, 2015) and sense of direction in life (Ratner & Burrow, 2017). Second, individuals with changes in sleeping patterns, for example, may experience changes in social and cognitive functioning (e.g., Fortier-Brochu, Beaulieu-Bonneau, Ivers, & Morin, 2012; Jennum, Ibsen, Avlund, & Kjellberg, 2014). These changes in functioning may then, in turn, result in difficulties engaging with personally expressive activities, social activities, or relationships. Individuals experiencing hypersomnia may simply sleep through plans they have with their peers, and people experiencing insomnia may have decreased capacities for the planning and execution of certain undertakings. Third, individuals with psychomotor issues may find once-fulfilling activities very difficult to execute (e.g., Sabbe et al., 1999; van Hoof, Hulstijn, van Mier, & Pagen, 1993). The relative inability to participate/succeed in activities that were once eudaimonic may lead one to disengage from such activities and subsequently shape one's sense of self and self-direction. Finally, and perhaps most profoundly, individuals affected by extreme fatigue may simply be unable to engage in activities that once brought them much pleasure, or helped them feel like they were making progress toward some life goal. Beyond these arguably higher-order activities, normally effortless activities (e.g., showering, eating, getting dressed) can become nearly impossible for someone living with severe fatigue stemming from depression. In a qualitative study of individuals with Chronic Fatigue Syndrome (Dickson et al., 2008), a loss of personal volition was among one of the most frequently cited consequences of the disorder and this gave rise to an "identity crisis." Individuals in Dickson and colleagues' study stated that this loss of control over their lives was related to difficulties with planning and forced removal from activities they once

loved. The patients stated that the syndrome “controlled virtually every aspect of their daily lives” (p. 463). This quote only provides a snapshot of a symptom related to Major Depressive Disorder, but testimonials like the one above offer us a glimpse into how personally (and psychologically) disruptive physiological symptoms like this can be. These aspects of personal agency speak directly to topics of personal expressiveness, fulfillment, and eudaimonic identity development (Waterman, 2011).

Derailment is thought of as being couched in identity literature; however, derailment also includes changes in future aims, purpose, and motivation. Difficulty concentrating, forgetfulness, and indecisiveness are classic symptoms of depression (APA, 2013) and these issues in cognition can perhaps be united with the theories previously put forth regarding overgeneral memory by way of impairments in executive control (e.g., Gotlib et al., 2004). Perhaps it is the case that these executive control issues could be extended to the literature that nominates memory specificity as a necessary component of forming future goals (Belcher & Kangas, 2014) and imagining the future (Williams et al., 1996). Therefore, the maintenance of self-direction may be, at least in part, crippled by depression’s dampening of executive functioning given purpose’s organizational nature and eye toward the future (McKnight & Kasdan, 2009). In other words, individuals with depression may experience great difficulty in effectively planning, organizing, envisioning, and executing their endeavors. Coupled with other symptoms of depression (e.g., fatigue, anhedonia), goal pursuits may be abandoned or forgotten entirely, thereby shifting one’s felt sense of purpose and self-direction in life due to disengagement. Supporting this notion, diagnosis with, or treatment of, a psychological disorder (including depression) within the last twelve months appears to significantly predict severe subjective distress relevant to one’s long-term goals (Samuolis, Barcellos, LaFlam, Belson, & Berard, 2015). These shifts in motivation

and direction not only affect the second feature of derailment, but also identity (given that identity is – in part – shaped by one’s future path; Williams & Gilovich, 2008). Therefore, as a consequence of changing life paths, one’s present sense of identity may be significantly altered.

Next, perceived self-worth has been positively tied to both identity (Ryeng, Kroger, & Martinussen, 2013) and purpose (Scheier et al., 2006) processes vis-à-vis self-esteem. With regard to directionality, in a meta-analytic review by Sowislo and Orth (2013), it was found that depression significantly erodes feelings of self-esteem. This idea supports a model sometimes referred to as the “scar model” of depression (Coyne, Gallo, Klinkman, & Calarco, 1998; Shahar & Davidson, 2003) whereby it is believed that depressive symptoms may leave lasting impressions on one’s self-concept (of which, self-esteem is significantly implicated; Campbell, 1999). Although Sowislo and Orth found that the reverse relationship was stronger (i.e., that decreases in one’s self-esteem leaves one vulnerable to developing depression), two significant directional effects (also see Harter & Jackson, 1993; Orth & Robins, 2013) suggests that the relationship between self-esteem and depression may be cyclical in nature. Indeed, a reciprocal-relations model of depression and self-esteem has been proposed (Orth & Robins, 2013; Shahar, Blatt, Zuroff, Kuperminc, & Leadbeater, 2004). It may be extended from these findings that when depressive symptoms arise, shifts in identity and self-direction may feasibly occur by way of worsening self-esteem and the lasting mark depression leaves on those it touches. Furthermore, when depressive symptoms bring about feelings of worthlessness, disengagement from meaningful goals may occur due to deterioration in related domains like self-efficacy (Chen, Gully, & Eden, 2004; Judge, Erez, Bono, & Thoresen, 2002; Schmuck & Sheldon, 2001). This disengagement from meaningful life goals could perceivably give rise to the sense that one has changed life course.

Following a discussion of self-worth, the final symptom of depression is approached: Suicidal ideation. On one hand, it has been hypothesized that suicidal ideation is, in part, the result of a penurious sense of self-continuity (Ball & Chandler, 1989; Chandler, 1994). Evidenced by Ball and Chandler (1989), hospitalized adolescents at risk for suicide show a near incapacity to recognize personal- and other-sameness in spite of characterological change. Ball and Chandler (1989) theorize that suicidal youth's extreme difficulty with seeing the self as a continuous figure underpins their impoverished ability to see how one's future self must deal with the consequences of the decisions made by one's present self. In their reasoning, anyone who is able to see the future as a mere continuation of the present has stake in ensuring the future self's well-being. Such an argument draws upon early theories of consciousness (e.g., James, 1910) which hold that knowing one persists allows people to commit to an otherwise unknowable future. Those with a more disrupted sense of continuity may not be able to make such a connection, thus, putting them at greater risk for deliberate self-harm in the present moment. Similarly, a study by MacLeod and Conway (2007) compared suicidal and control subjects on tasks where they were asked to generate self-relevant and other-relevant future events. While the suicidal and control groups did not significantly differ in terms of ability to generate other-relevant future events, control participants outperformed suicidal participants in generating self-relevant future events. As such, MacLeod and Conway conclude that perhaps individuals feel suicidal as a result of not being able to see *themselves* in the future. Indeed, it seems to be the case that the well-being benefits of future thinking cannot be reaped without some degree of plausibility, as perceived likelihood of a given goal helps maintain engagement with that goal (Schmuck & Sheldon, 2001).

In the same breath, it might also be said that because suicidal individuals have difficulty imagining the future, and it is known that past and future thinking are highly related (e.g., Schacter & Addis, 2009), one's sense continuity could be significantly disrupted by these noted difficulties with temporal thinking. Consequently, it seems highly unlikely that one can develop, maintain, and amend self-direction and identity content if suicidality is related to difficulties in temporal thinking. Further, if one does not see themselves living beyond the present moment, they are unlikely to take the steps to make plans for the future or engage in any behaviors conducive to a once-present sense of self-direction. Perhaps it is the case that once one starts to contemplate ending their life, a decrease in engagement with temporal thinking takes place due to a hopeless and negative view of the future (key components of the cognitive triad of depression; Beck, 1967). This could significantly stifle one's ability to think about where they are headed thus significantly weakening or changing one's present sense of identity.

In short, it is highly unlikely for an individual to begin life with doubts about persisting into the future. Individuals gain the ability to project themselves into the future between the ages and 3 and 5 years (Atance, 2008; Atance & O'Neill, 2005) and when you ask a child what they would like to be when they grow up, you will probably be met with answers like "doctor," "fireman," and "veterinarian." Thus, suicidal ideation may represent an *inherent* change of self-direction because no greater threat to one's current course exists than the threat that one's course ceases entirely. Such is the case when individuals can no longer envision themselves living beyond the present and this, reasonably, is the epitome of derailment.

The Transition to College: Setting the Stage for a Confluence of Reviewed Processes

To this point, the relationship between depression and derailment has been discussed devoid of setting. The transition to adulthood, and the college experience in particular, is a

setting that provides a compelling space for individuals to grow and change. Most importantly, however, college may provide an opportunity for individuals to be highly attentive to that change. In the college context, individuals are often confronted with questions relevant to who they are and where they are going. The most archetypal examples of this include asking students to select a major, or the existence of social groups based on occupational goals. The increased salience of these types of questions in college could feasibly exacerbate one's susceptibility to feeling derailed. While many individuals flourish in college, it is also an environment where some may flounder. For this latter group, identifying the developmental pathways that lead toward depressive symptoms and derailment is important.

The Search for Identity in College and Associated Problems. For emerging adults, the college environment can assist the search for a tangible sense of identity and self-direction. In most postsecondary settings, individuals gain exposure to ideological and cultural diversity, and take a variety of courses from different areas of study. As a result, college may provide a space for individuals to “try on” several different possible selves thus facilitating identity exploration (Dunkel, 2000; Dunkel & Anthis, 2001; Markus & Nurius, 1986). Although many finish college with higher degrees of identity commitment relative to the start (e.g., Meeus, 2011; Waterman, 1982; Waterman, Geary & Waterman, 1974; Waterman & Waterman, 1971), finding this sense is not easy. Indeed, identity distress (uneasiness stemming from inconsistent identity commitments or incomplete identity formation; Berman, Montgomery, & Kurtines, 2004) often accompanies heightened identity exploration and low identity commitment. At its worst, identity distress may lead to impairment given that Berman and his colleagues modeled measurement of the construct after identity-relevant dysfunction found in earlier versions of the *DSM* (e.g., APA, 1987). Lending credence to this idea of identity-related impairment, identity distress has been

consistently linked to several negative mental health outcomes including symptoms of depression, anxiety, somatization, and substance misuse (e.g., Berman, Weems, & Stickle, 2006; Samuolis et al., 2015). As such, the normative identity exploration that occurs during college may bring with it, for some, clinical symptoms that can wreak havoc on their functioning.

Even for those who enter college knowing who they are and where they are headed, learning “how to adult” is an incredible change of pace. When individuals leave home for the first time, in a matter of only a few months, they must adjust to a new physical environment, cope with the loss of old peer groups, assimilate into new peer groups, negotiate changes in parent-child dynamics, and organize newfound academic and financial responsibilities (Aquilino, 2006; Avard, Manton, English, & Walker, 2005; Larose & Boivin 1998; Pascarella & Terenzini, 2005). Due to all these moving parts, this life transition can be understandably overwhelming, and college students – especially freshmen – are vulnerable to stress (e.g., Compas, Wagner, Slavin, & Vannatta, 1986). Given the demands of becoming an adult, it may be rather unsurprising to learn that the transition to college often marks the onset of many clinical concerns such as increased depressive symptomatology (Alfeld-Liro & Sigelman, 1998; Dyson & Renk, 2006), substance use and experimentation (Barnes, Welte, Hoffman, & Tidwell, 2010; Maggs, 1997; O'Malley & Johnston, 2002; White, Labouvie, & Papadaratsakis, 2005), anxiety and sleep disturbances (Doane, Gress-Smith, & Breitenstein, 2015), and disordered patterns of eating and compensatory behavior (Eisenberg, Nicklett, Roeder, & Kirz, 2011; Schaumberg, Anderson, Reilly, & Anderson, 2014). Although many individuals may experience problems that are time-limited in nature (e.g., White, Labouvie, & Papadaratsakis, 2005), helping people cope with the transition to and through college may be able to help promote personal and academic outcomes for a broader array of individuals.

The Present Study

In establishing that derailment may indeed predict downstream depressive symptoms, Burrow and colleagues (2017) inspire new avenues for the investigation of how perceiving self-change impacts well-being. Based on what is known about how depression shapes cognition (e.g., Beck, 2008; Disner, Beevers, Haigh, & Beck, 2011) and one's daily lived experiences (APA, 2013), this thesis investigates how derailment may also be an outcome of depression. A depression-derailment feedback loop is proposed, such that the two work in tandem to predict one another through time. Armed with such knowledge, researchers and practitioners might be able to triangulate and better identify individuals most vulnerable to subsequent negative mental health outcomes. The present study will empirically test if such reciprocity exists between depression and derailment by following a cohort of students over the course of one year at college. By gaining a more comprehensive view of these dynamic processes, it is hoped that the results of this study can help start a conversation about how to smooth the course of this major life transition, and improve psychological outcomes for those navigating it.

METHOD

Participants

At Wave 1 a total of 939 participants provided contact information and at least partial data. From this initial participant pool, participants were recruited to take part in subsequent waves of the study. Attrition throughout the course of the study was moderate: At Wave 2, 64.11% ($n = 602$) of participants returned; at Wave 3, 47.39% ($n = 445$) of participants returned; and at Wave 4, 44.83% ($n = 421$) of participants returned. Among cases providing at least partial data at Wave 1, this study experienced a total of 56% attrition by Wave 4.

The sample was comprised of largely female participants (63.6%, $n = 597$), and ranged in age from 16 to 31 years ($M = 18.64$, $SD = 1.55$). Out of the entire sample, only 8.0% ($n = 75$) of participants did not report their biological sex or their age. Participants were largely freshmen (62.0%, $n = 582$) students, but the sample spanned across all years of college. A total of 10.3% ($n = 97$) reported being in their sophomore year, 8.8% ($n = 83$) reported being in their junior year, 9.3% ($n = 87$) reported being in their senior year, 0.4% ($n = 4$) reported being of 5th-year senior status, and 1.0% ($n = 9$) reported being graduate students. Only 8.2% ($n = 77$) did not report their academic year. Over one-third (35.6%, $n = 334$) of the participants reported being from the College of Human Ecology, but several other colleges from the university were also represented: 13.3% ($n = 125$) were from the College of Agriculture and Life Sciences; 1.3% ($n = 12$) were from the College of Architecture, Art, and Planning; 21.2% ($n = 199$) were from the College of Arts and Sciences; 15.9% ($n = 149$) were from the College of Engineering; 1.9% ($n = 18$) were from the School of Hotel Administration; and 2.7% ($n = 25$) were from the School of Industrial and Labor Relations. No students reported being from Cornell Law School, Samuel Curtis Johnson Graduate School of Management, or the College of Veterinary Medicine and

8.2% ($n = 77$) of the sample failed to report their college affiliation. A total of 65.6% ($n = 616$) of participants identified this academic year as being their first year away from home for college/university.

The sample was predominantly split between participants who identified racially/ethnically as White/Caucasian, non-Hispanic 39.4% ($n = 338$) and Asian/Asian-American or Pacific Islander 32.8% ($n = 308$). Smaller subsets of participants identified as Black/African-American, non-Hispanic 6.0% ($n = 56$); Hispanic or Latino/a 5.1% ($n = 48$); Native American or Alaskan Native 0.4% ($n = 4$); an unlisted racial/ethnic background 1.5% ($n = 14$); and multiracial 9.6% ($n = 90$). A total of 8.6% ($n = 81$) failed to report their racial/ethnic background. Highest reported level of maternal education varied across participants. A total of 3.2% ($n = 30$) reported that their mother did not complete high school, 7.7% ($n = 72$) reported that their mother had obtained a high school diploma or equivalent, 13.1% ($n = 123$) reported that their mother had completed some college or vocational/technical school, 30.9% ($n = 290$) reported that their mother had completed their bachelor's degree, and 36.7% ($n = 345$) reported that their mother had completed graduate or professional school. Similarly, 3.6% ($n = 34$) reported that their father did not complete high school, 8.3% ($n = 78$) reported that their father had obtained a high school diploma or equivalent, 8.7% ($n = 82$) reported that their father had completed some college or vocational/technical school, 26.8% ($n = 252$) reported that their father had completed their bachelor's degree, and 44.1% ($n = 414$) reported that their father had completed graduate or professional school. Missing data comprised 8.4% ($n = 79$) of both maternal and paternal educational background data.

Materials

Assessments reported below were a part of a larger longitudinal study of developmental changes that occur during the course of a year at college. The measures/variables reported and analyzed here are only those relevant to the present study's hypotheses. A complete copy of the survey can be found in Appendix A.

Demographic Questionnaire. A demographic survey was developed for the purposes of the present study. Participants were asked to provide demographic information at the end of the Wave 1 survey. Participants choosing not to disclose specific demographic information were asked for this missing information again at subsequent waves until it was reported or the study ended.

Beck Depression Inventory-II. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is among the most widely used self-reported clinical assessment tools for quantifying depressive symptoms. Participants are asked to pick one statement from a presented group of four that best represents the way they have been feeling on twenty-one dimensions over the past two weeks. Each dimension represents a single item on the scale with responses ranging from a numerical indicator of 0 to 3. Dimensions cover topics such as sadness, guilty feelings, punishment feelings, self-dislike, agitation, crying, suicidal ideation, worthlessness, changes in sleeping pattern, loss of energy, and tiredness or fatigue. As an example, participants responding to the "Sadness" item could choose among the four following descriptors: "I do not feel sad," "I feel sad much of the time," "I am sad all of the time," and "I am so sad or unhappy that I can't stand it." If multiple statements within each group apply to a person equally, the participant is asked to select the statement that appears furthest down the group's list (corresponding to a higher numerical rating). Scores on this measure are summed across the 21-items resulting in a

composite score ranging from 0 to 63. Since the scores are summed, a score of 2, for example, could correspond to an individual marking moderate elevation on one item or slight elevation on two items. Scores of 0-10 indicate normative mood fluctuation, 11-16 indicate a mild mood disturbance, 17-20 indicate borderline clinical depression, 21-30 indicate moderate depression, 31-40 indicate severe depression, and scores of 41 and above indicate extreme cases of depression. For the composite score, the BDI-II has demonstrated excellent internal consistency ($\alpha = .92$). In the present study, the BDI-II evidenced sufficient internal consistency across all four waves (calculated using listwise deletion of missing cases; $\alpha_{W1} = .89$, $\alpha_{W2} = .92$, $\alpha_{W3} = .92$, $\alpha_{W4} = .95$).

The Derailment Scale. The Derailment Scale (Burrow, Hill, Ratner, & Fuller-Rowell, 2017) is a 10-item self-report measure used to assess the degree to which individuals feel temporally discrepant in their sense of self and self-direction. Participants are asked to rate the extent to which they agree with statements (e.g., “I’m surprised at who I’ve become”) on a 5-point Likert scale ranging from (1) ‘*Strongly Disagree*’ to (5) ‘*Strongly Agree*.’ In its validation, the Derailment Scale evidenced sufficient internal consistency ranging from $\alpha = .74$ to $\alpha = .88$ across the six studies presented. Internal consistency across the four waves for the present study also evidenced acceptable estimates (calculated using listwise deletion of missing cases; $\alpha_{W1} = .81$, $\alpha_{W2} = .79$, $\alpha_{W3} = .78$, $\alpha_{W4} = .78$).

Procedure

The present study was approved by Cornell University’s Institutional Review Board (Protocol ID#: 1606006394; see Appendix B). Participants were recruited by having Wave 1 of the survey distributed through resident hall email listservs, the College of Human Ecology email listserv, and flyers distributed in-person at freshmen orientation. Participants accessing the link

were directed to Qualtrics to view the Wave 1 consent form (see Appendix C). Data for Wave 1 of the survey was collected from August 15th, 2016 to September 1st, 2016. Once the initial participant pool was established, participants were invited to participate in subsequent waves of the study via email at the beginning and end of the Fall 2016 and Spring 2017 semesters. Data for Wave 2 of the study was collected from November 13th, 2016 to December 2nd, 2016; data for Wave 3 of the study was collected from February 4th, 2017 to February 19th, 2017; and data for Wave 4 of the study was collected from April 23rd, 2017 to May 7th, 2017. To be clear, the end-of-semester survey was intentionally collected before the beginning of the university-wide “final exam period.” During this period, lectures have ended and students are given uninterrupted time to study before final exams are scheduled. The plan to collect data while lectures were still in session was employed to (1) aim for the most participant retention and (2) reduce the conflation of depression scores with the inherent stress of studying/taking part in final exams. Participants were asked to re-consent at the start of each wave, and provide their NetID (a form of identification that we could use to follow-up with them via email for later waves). NetIDs were converted to CaseIDs following data collection to maintain participant anonymity. The survey took participants approximately 15 minutes to complete. If a participant missed a wave, they were allowed to take part in subsequent waves.

During each wave, participants were offered a coupon to The Cornell Store (Cornell University’s bookstore) plus an opportunity to win a gift card to The Cornell Store via raffle. At the end of each survey, participants received a coupon code that could be redeemed at any of The Cornell Store’s in-store locations. At Wave 1, participants were guaranteed a \$5-off coupon to The Cornell Store plus an opportunity to win a \$100 or \$50 gift card. At Wave 2, participants were guaranteed a coupon for 25%-off one Cornell-branded item from The Cornell Store plus an

opportunity to win a \$50 gift card. At Wave 3, participants were offered a coupon for 25% -off one hooded sweatshirt from The Cornell Store plus an opportunity to win a \$50 gift card. At Wave 4, participants were offered a coupon for 25%-off their entire purchase at The Cornell Store plus an opportunity to win a \$100 gift card or one of two \$50 gift cards. Participants were given an extra ticket in the final, Wave 4 raffle for every wave they responded to over the course of the academic year (maximum number of tickets: 4). Participants who took part in all four waves of the study were entered into a special raffle pool, where they had an additional chance to win a \$100 gift card or one of two \$50 gift cards.

A project page for this study was created with the Open Science Framework (OSF) on June 20th, 2017 (<https://osf.io/ewnva/>). The project was successfully registered on the same day (<https://osf.io/w3db7/>) with an embargo to be lifted on January 1st, 2018. The embargo was instituted with the hope that the present study, as well as the currently in-revision manuscript of the derailment measurement piece (Burrow et al., 2017), could be completed before the data and study information became public record. Data relevant to the present study's analyses, R script, and the preregistration document can all be found at the project/registration pages on OSF. Should any of the R script change (due to overlooked errors, exploratory analyses, etc.), the most up-to-date documents will be uploaded onto the editable OSF project page (<https://osf.io/ewnva/>). Unregistered significance tests will be explicitly labeled as exploratory both in the present thesis and in any subsequent peer-reviewed publications.

Analytic Strategy

All analyses were completed using SPSS (Version 24), R (R Core Team, 2017) and R Studio software (RStudio Team, 2016). Basic descriptive data for relevant study variables were first derived for each wave. At each wave, participants were asked to complete a blatant

instructional attention check. Participants failing an attention check had their data for that wave excluded; however, if the same participant passed the attention check at a different wave, their data on that wave was retained. Asking participants to complete instructional attention checks does not appear to influence subsequent responses (Kung, Kwon, & Brown, 2017). The structural model described below was also examined for outliers using the generalized Cook's Distance (Cook, 1977; Flora, LaBrish, & Chalmers, 2012; Pek & MacCallum, 2011) function in the *faoutlier* package (Chalmers & Flora, 2015). Cook's distance values were then plotted on a boxplot and cases falling more than 2.5 times the interquartile range were excluded from analyses. Missing data within the structural equation models were treated using Full Information Maximum Likelihood Estimation, implicitly assuming that data are at least missing at random (MAR; Little & Rubin, 1986).

When the present study was conceptualized, a common tool of developmental methodology was planned to test the bidirectional influence of two variables on one another over time: The autoregressive cross-lagged panel model (ACLP; Campbell, 1963; Kenny, 1973). Despite its popularity, several limitations of the ACLP model have been noted including the ACLP model's inability to separate between- and within-person effects over time. This conflation of non-equivalent effects often results in inflated path estimates, thus making the ACLP model not ideally suited for making inferences about intra-individual change (see also Berry & Willoughby, 2016). In response to this criticism, to test the main study hypothesis, a latent curve model with structured residuals (see Figure 1; Curran, Howard, Bainter, Lane, & McGinley, 2014) was employed using the *lavaan* package (Rosseel, 2012) in R Studio. The R script for removing attention failures, detecting outliers, and constructing this model is provided on the OSF editable project page for this study (<https://osf.io/ewnva/>).

Following the suggestions of Kline (2010), the chi-square statistic, Comparative Fit Index (CFI; Bentler, 1990), Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), Bayesian Information Criterion (BIC), Akaike's Information Criterion (AIC), root mean square error of approximation (RSMEA; Browne & Cudeck, 1993; Steiger & Lind, 1980), and standardized root mean square residual (SRMR; Bentler, 1995) will be reported and used to determine model adequacy. To judge if the model fits the data, a chi-square statistic with an associated p -value greater than .05, a CFI and TFI value greater than .95 (Hu & Bentler, 1999), an RSMEA value less than .10 (MacCallum, Browne, & Sugawara, 1996), and an SRMR value less than .08 (Hu & Bentler, 1999) were sought. The standard $p < .05$ criterion was used to appraise the coefficients of all modeled pathways. It was hypothesized that the residual estimates of both constructs (depression and derailment) would evidence significant stability across time, crossed effects between waves would evidence significant and positive associations, and depression and derailment would significantly and positively covary at each wave.

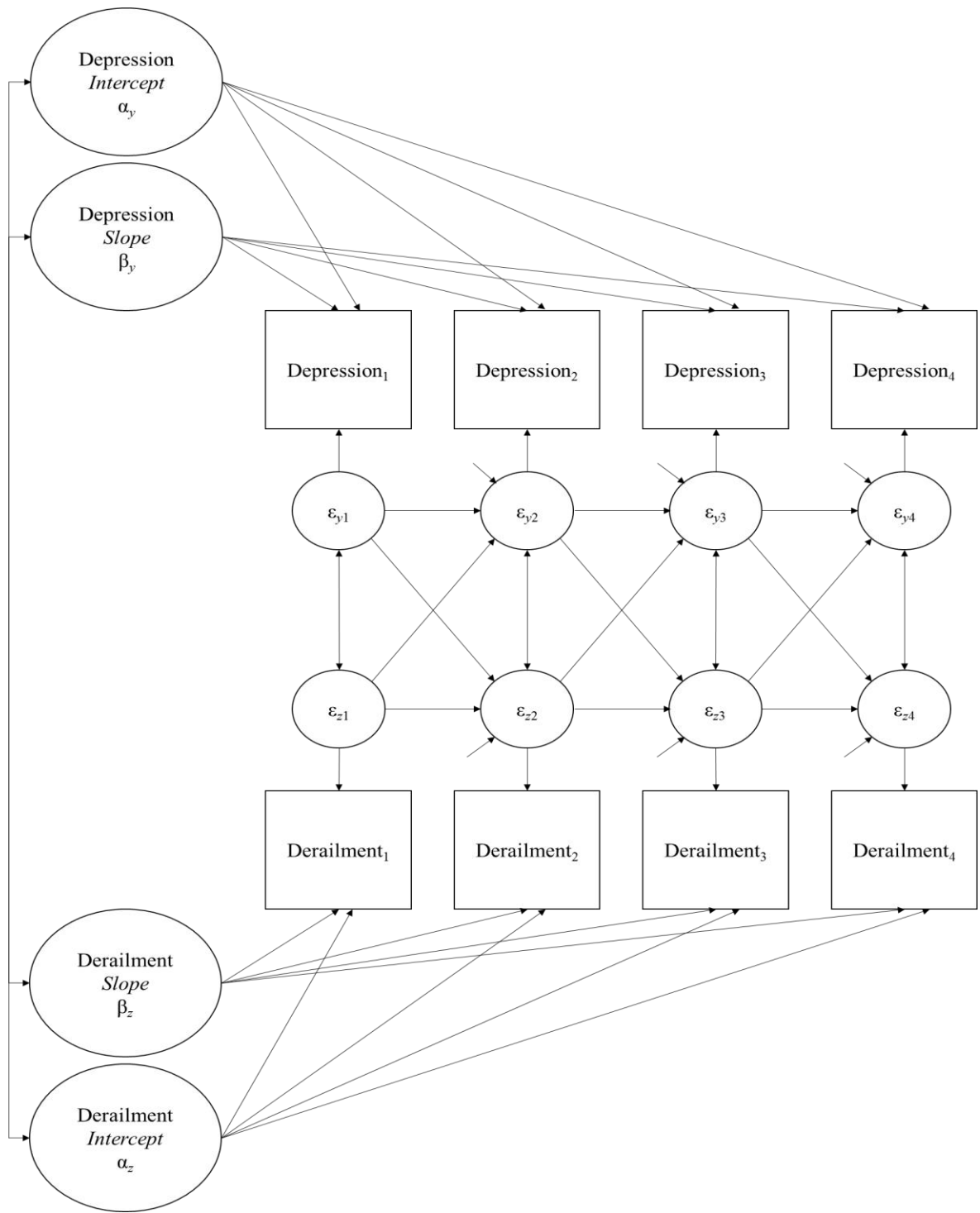


Figure 1. Theoretical Model of Hypothesized Association between Depression and Derailment using an Autoregressive Latent Trajectory Model with Structured Residuals

RESULTS

Descriptive Statistics and Unregistered Preliminary Analyses

Descriptive Statistics and Frequencies. Descriptive statistics for the sample on depression and derailment variables were first derived for each wave, and then calculated for the total score across the waves (Table 2). Figure 2 displays histograms with overlaid Kernel Density Estimates, for the distribution of scores on depression and derailment at each of the four waves. Finally, spaghetti plots of derailment (Figure 3a) and depression (Figure 3b) show the individual trajectories of these constructs, for every person taking part in the study, over time. The thickened line in Figures 3a and 3b is the average (i.e., between-person) trajectory across all time points of study.

Table 2

Descriptive Statistics of Depression and Derailment

Wave	Dep. <i>n</i>	Dep. <i>M (SD)</i>	Dep. Min. – Max.	Derail. <i>n</i>	Derail. <i>M (SD)</i>	Derail. Min. – Max.
1 (Start, Fall 2016)	854	7.68 (7.28)	0 – 52	884	3.23 (0.64)	1.20 – 4.90
2 (End, Fall 2016)	581	9.57 (8.84)	0 – 56	588	3.17 (0.64)	1.00 – 4.60
3 (Start, Spring 2017)	414	8.30 (8.61)	0 – 59	425	3.19 (0.68)	1.10 – 5.00
4 (End, Spring 2017)	381	10.05 (10.54)	0 – 59	386	3.17 (0.62)	1.30 – 4.70
Total		8.69 (8.62)	0 – 59		3.20 (0.65)	1.00 – 5.00

Notes: Descriptive statistics recovered using listwise deletion to handle missing cases.
Dep. = Depression, Derail. = Derailment.

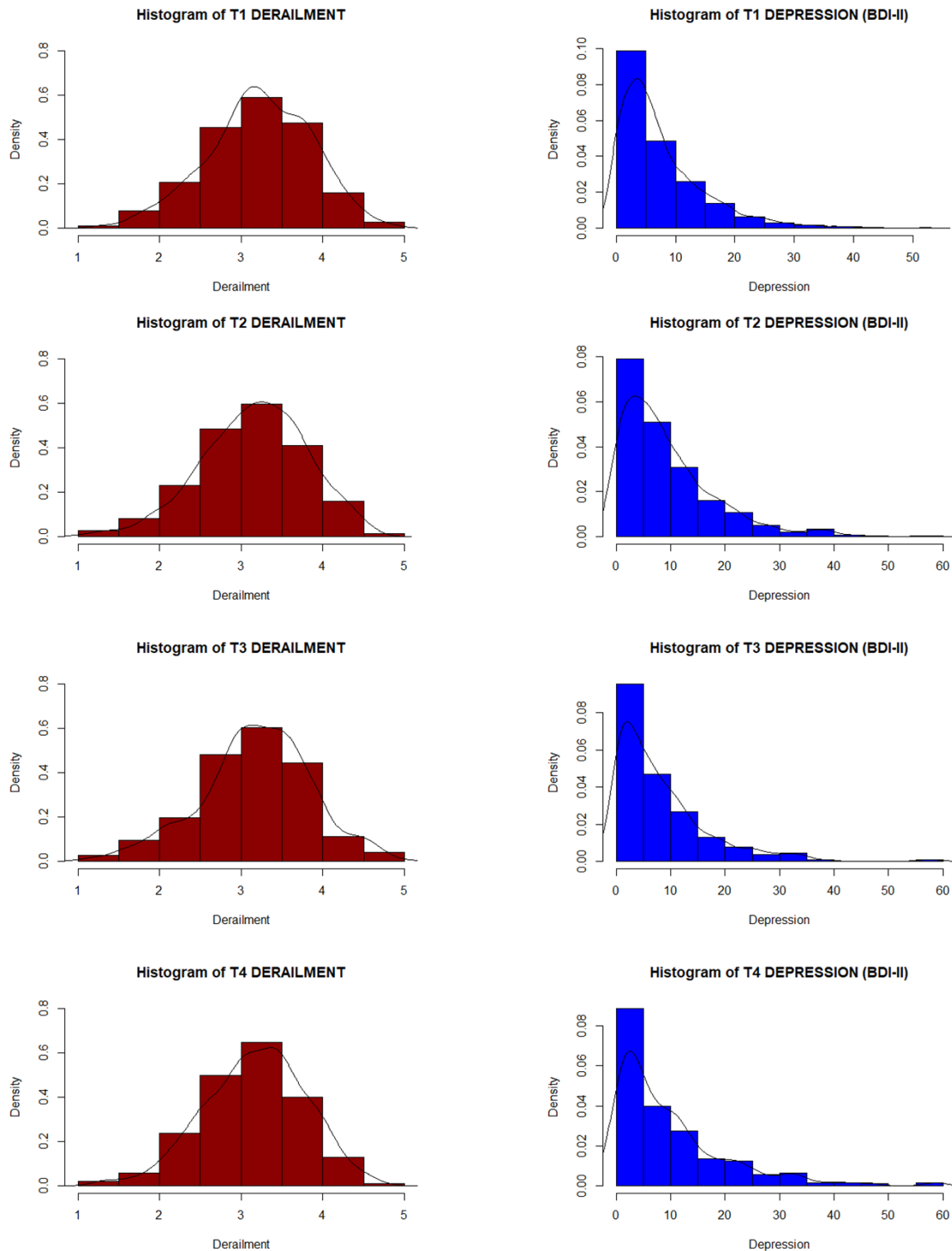


Figure 2. Histograms of Derailment and Depression at Each Wave. Black line is the Kernel Density Estimate for the distribution at the indicated wave.

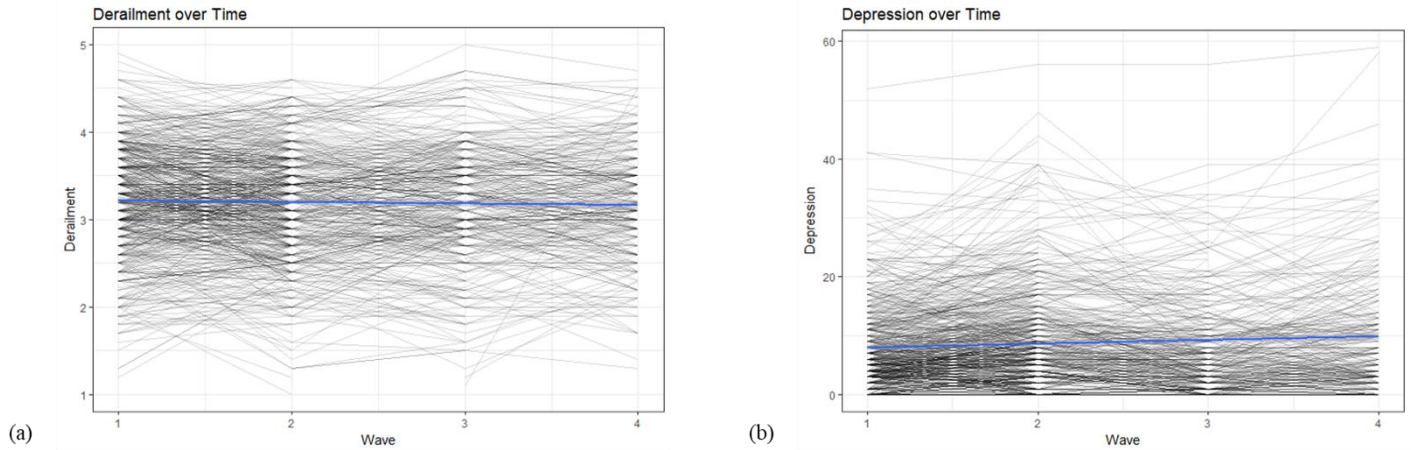


Figure 3. Spaghetti Plots of Derailment and Depression Trajectories over the Course of the Study. Black lines each represent an individual case over the course of the study whereas the blue solid line represents the average trajectory of the mean scores. Transparency has been added to the individual trajectories to show where lines appear most dense.

As mentioned above, the data for the present analyses were collected as part of a larger longitudinal study. An attention check was embedded in measures that appeared after depression and derailment scales were presented. After preregistration, it was discovered that some cases had a missing attention check and data on depression/derailment within the same wave (e.g., the participant had started the study and quit midway). In the interest of power, these missing attention check cases were retained. Among those with usable data on at least derailment (the first measure appearing first in the battery), at Wave 1, a total of 107 individuals failed the attention check, 60 participants were missing the attention check, and the vast majority of participants ($n = 717$) passed it. At Wave 2, a total of 84 individuals failed the attention check, 26 were missing the attention check, and 478 passed it. At Wave 3, a total of 48 individuals failed the attention check, 19 participants were missing the attention check, and 358 individuals passed it. Finally, at Wave 4, a total of 33 individuals failed the attention check, 15 participants

were missing the attention check, and 339 individuals passed it. Descriptive statistics calculated above include individuals who had failed the attention check to get a sense for the baseline data. All analyses that follow utilize data that have been cleansed of cases with attention failures.

Univariate Latent Growth Models. For purely descriptive purposes, depression and derailment were modeled separately in unconditional univariate latent growth models. Each growth model began with an intercept-only model, followed by successive additions of slope and time-adjacent autoregressive factors. Then, because of their nested nature, Likelihood Ratio Tests (LRT) were conducted to determine which growth models, for depression and derailment respectively, best fit the data. Such a progressive model-building strategy is employed by many researchers interested in ultimately testing complex, dynamic models (e.g., Curran et al., 2014). Regardless of the results that follow, the ALT-SR as specified in the analytic strategy and preregistration (i.e., with linear components and time-adjacent auto-regressions) was followed as closely as possible to test the hypotheses of interest. These descriptive univariate models, however, may be able to provide a useful guide should respecification of the hypothesized model be necessary.

First, an intercept-only latent growth model was fit for depression over the course of the study. This model included a mean and a variance structure for an intercept factor along with residuals among the repeated-measure manifest variables that were constrained to be equal over time. As one may expect, this no-change model fit the data poorly (see Table 3). Next, a slope factor ($\lambda_t = 0, 1, 2, 3$) was added to the intercept-only model to test an average linear trajectory of depression. Again, the residuals of the repeated-measure manifest variables were equated. Along with their covariance, a mean and a variance for the intercept and slope factors were also estimated. As can be observed in Table 3, this model had an overall fit that appears superior to

the intercept-only model, but still performs slightly below typically-accepted model thresholds (Kline, 2010). Because the intercept-only model is nested within the linear model, a formal comparison of model fit was performed using a Likelihood Ratio Test. Indeed, the linear model appeared to perform significantly better than the intercept-only model ($\chi^2_{\Delta}(3) = 133.28, p < .001$) despite its less-than-ideal overall model fit. Finally, the linear model was expanded to include time-adjacent auto-regressions. This autoregressive model evidenced adequate overall fit according to most tests (see Table 3), and fit the data significantly better than the linear model for depression ($\chi^2_{\Delta}(3) = 58.43, p < .001$).

Because of its superior model fit, the linear depression model with time-adjacent auto-regressions was chosen for interpretation. Over the course of the study, depression scores evidenced significant and positive rank-order stability from Wave 1 to Wave 2 ($b = .16, SE = .06, p = .007$), but not from Wave 2 to Wave 3 ($b = -0.04, SE = .09$) or from Wave 3 to Wave 4 ($b = 0.04, SE = .15$). The intercept and the slope evidenced a significant and positive covariance ($\psi_{is} = 3.40, SE = 1.65, p = .039$) indicating that cases with the highest starting depression scores changed, on average, the most over the course of the study. The intercept factor for depression evidenced significant mean ($\hat{\mu}_i = 7.66, SE = 0.25$) and variance ($\hat{\psi}_i = 32.36, SE = 3.03$) estimates, indicating an average non-zero starting value and potentially informative individual variability around the depression starting score. The mean of the slope factor for depression ($\hat{\mu}_s = .54, SE = .43, p = .212$) and the observed variance among the individual trajectories ($\hat{\psi}_s = 2.57, SE = 1.33, p = .053$) failed to reach statistical significance, indicating that the average rate of change was somewhat similar across participants and the average depression score was changing very little over the course of the study.

The same incremental latent growth modeling procedure was then applied to derailment. First, an intercept-only model was fitted in which only the mean and the variance of the intercept factor were estimated, and the residuals of the indicators were equated over time. Although the traditional chi-square test indicated that the model did not fit the data (see Table 3), other fit statistics indicated that the intercept-only model for derailment was adequate. This trend was observed across each model extension (i.e., both the linear, and linear plus auto-regressive models). Regarding formal tests of improvement in model fit, the linear model for derailment did not fit significantly better than the intercept-only model ($\chi^2_{\Delta}(3) = 6.32, p = .097$) and the autoregressive model did not fit significantly better than the linear model ($\chi^2_{\Delta}(3) = 7.62, p = .055$).

Table 3.

Univariate Latent Growth Models for Depression and Derailment

	χ^2	<i>df</i>	CFI (TLI)	AIC	BIC	RMSEA	SRMR
Depression							
Intercept-only	213.41***	11	.79 (.88)	13040.25	13054.45	0.15	0.14
Linear Model	80.13***	8	.92 (.94)	12912.97	12941.36	0.10	0.07
Linear Model with Auto-regressions	21.70**	5	.98 (.98)	12860.55	12903.12	0.06	0.03
Derailment							
Intercept-only	25.26**	11	.98 (.99)	3200.19	3214.47	0.04	0.08
Linear Model	18.94**	8	.99 (.99)	3199.87	3228.44	0.04	0.09
Linear Model with Auto-regressions	11.32*	5	.99 (.99)	3198.25	3241.10	0.04	0.07

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$; CFI = Comparative Fit Index; TLI = Tucker-Lewis Fit Index; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Given that these models all appear to fit the data similarly, a decision was made to interpret the intercept-only model for derailment. Even though the AIC did not favor this model,

it did have the lowest Bayesian Information Criterion (BIC) of any of the nested models. Within the intercept-only model, derailment's intercept factor evidenced significant mean ($\hat{\mu}_i = 3.21$, $SE = 0.20$) and variance ($\hat{\psi}_i = 0.28$, $SE = 0.02$) parameters, indicating an average non-zero starting value for derailment and possibly non-trivial variability in overall derailment scores across the sample.

Preregistered Hypothesis Testing

Preparing the ALT-SR. In preparing the autoregressive latent trajectory model with structured residuals (ALT-SR) for hypothesis testing consistent with the preregistration, parallel problems with model specification and the removal of influential outliers were encountered. In constructing the model according to the preregistered plan, several errors occurred during estimation of this model. When estimated, as registered, the variance-covariance parameters were negative resulting in a non-positive definite matrix of latent parameters associated with the latent factors. This estimation error led to issues with using the *faoutlier* package and Generalized Cook's D function for identification of influential outliers.

To improve convergence, the structure of the model was addressed. Given that the univariate LGM analyses suggested that an intercept-only structure was best-fitting for derailment's trajectory, a decision was made to remove derailment's slope factor from the ALT-SR. After doing so, the model was left with six elements in the latent variance-covariance matrix: Derailment's intercept variance, depression's intercept variance, depression's slope variance, the covariance of derailment's intercept with depression's intercept, the covariance of derailment's intercept with depression's slope, and the covariance of depression's intercept with depression's slope. When the problems with the latent covariance matrix continued to persist, the variances and covariances of the remaining latent factors were sequentially constrained to zero

until the model converged without errors. In the final model, the only freed latent variance-covariance component that remained was derailment's intercept variance.

With the issues involving the latent variance-covariance matrix seemingly resolved, the identification of influential outliers took place. Several attempts were made to adhere to the preregistration and utilize the *faoutlier* package; however, results suggested the removal of hundreds of cases (and greatly attenuating power). In light of this, a method of identifying outlying cases that would afford greater control and more evidence was sought. Ultimately, the strategy for outlier identification shifted from using the *faoutlier* package to the manual calculation and identification of outliers using dfbetas estimates for each of the 28 estimated parameters in the resultant ALT-SR model. Dfbetas are estimated by running the model many times, each time excluding one single case. The dfbetas are then calculated by subtracting a given coefficient estimate for a model with the case from the resultant coefficient for a model with the case excluded, then dividing the difference score by the standard error of the coefficient with the model removed. Standard thresholds for dfbetas are either |1.0| or sample-sized based thresholds determined by $2/\sqrt{n}$ (in this case, $2/\sqrt{937} = .065$). Given that the sample-sized based threshold would have again resulted in the removal of hundreds of cases, a subjective threshold, |0.5|, was chosen to exclude influential outliers. With this threshold in place, a total of 11 cases were identified as potentially influential and were thus removed before running the modified ALT-SR.

Testing the ALT-SR. After removing the failed attention checks, the 11 outlying cases, and the empty rows in the data, a total of 853 cases were used by the *lavaan* package to estimate the modified ALT-SR. The modified ALT-SR differs from the originally preregistered ALT-SR only in the sense that (a) the linear slope factor for derailment was removed and (b) most of the

latent variance components were constrained to zero except for derailment's intercept. Without these changes, the interpretation of the model would have been precarious. The fit indices of this adjusted model suggested mediocre match between the proposed theory and the data: $\chi^2(16) = 78.91, p < .001$; CFI = .97, TLI = .94; SRMR = .10; RMSEA = .07, 90% CI [.05, 0.08], p of Close Fit ($p_{\text{Close}}; \text{RMSEA} \leq .05$) = .022; BIC = 15584.89, AIC = 15451.93. While both the CFI and the RMSEA technically met the thresholds designated in the Analytical Strategy and preregistration of this study, several of the fit indices did not. For consistency with the preregistration, unstandardized path coefficients are reported in Table 4; however, because of the disagreement among the fit statistics, these estimates should be interpreted with caution. Substantive interpretation of the findings will follow exploratory respecification of the model based on the modification indices.

Table 4.

Initial Autoregressive Latent Trajectory Model with Structured Residuals

	Unstd. Coefficient Estimate	S.E.	z-value	p-value
Autoregressive Stability				
Derailment, W1 to 2	-.06	.01	-5.17	< .001
Derailment, W2 to 3	-.04	.01	-3.34	.001
Derailment, W3 to 4	-.06	.01	-5.22	< .001
Depression, W1 to 2	.84	.04	20.99	< .001
Depression, W2 to 3	.83	.03	25.54	< .001
Depression, W3 to 4	.92	.05	20.26	< .001
Crossed Effects				
Derailment W1 predicts Depression W2	-.63	.17	-3.66	< .001
Derailment W2 predicts Depression W3	-.75	.28	-2.71	.007
Derailment W3 predicts Depression W4	.56	.40	1.40	.163
Depression W1 predicts Derailment W2	.02	.004	4.94	< .001
Depression W2 predicts Derailment W3	.01	.003	4.07	< .001
Depression W3 predicts Derailment W4	.02	.003	6.02	< .001
Covariances				
Derailment W1 with Depression W1	.68	.14	4.68	< .001
Derailment W2 with Depression W2	.54	.12	4.45	< .001

Derailment W3 with Depression W3	.22	.11	2.06	.040
Derailment W4 with Depression W4	.25	.14	1.79	.073
Intercepts				
Derailment Intercept	3.23	.02	136.97	< .001
Depression Intercept	7.36	.24	30.88	< .001
Depression Slope	-2.34	.41	-5.70	< .001
Variances				
Derailment Intercept	.28	.017	16.04	< .001
Derailment W1	.17	.013	12.50	< .001
Derailment W2	.13	.012	10.29	< .001
Derailment W3	.12	.013	9.41	< .001
Derailment W4	.11	.012	8.96	< .001
Depression Intercept				
Depression Slope				
Depression W1	44.53	2.29	19.43	< .001
Depression W2	32.01	2.13	15.04	< .001
Depression W3	19.71	1.61	12.22	< .001
Depression W4	35.34	3.09	11.42	< .001

Notes. All estimates are unstandardized. W = Wave

Depression's intercept and slope were fixed to zero. Thus, variances and covariances involving these terms will be zero.

Unregistered Exploratory Analyses

Autoregressive Cross-Lagged Panel Model. Given the less-than-ideal fit indices evidenced by the initial ALT-SR model, modification indices were examined to get a sense of where the source of misfit was located. In particular, it was noted that the variance components of the latent structure were a large source of model misfit. With these problems signaled by the modification indices, an exploratory autoregressive cross-lagged panel (ACLP) model was employed in an attempt to examine the reciprocal nature of the constructs, while circumventing the latent structure of the ALT-SR. Similar to the ALT-SR, majority of fit indices suggested that the model evidenced inadequate fit: $\chi^2(12) = 125.20$, $p < .001$; CFI = .94, TLI = .85; SRMR = .06; RMSEA = .11, 90% CI [.09, 0.12], $p_{\text{Close}} < .001$; BIC = 15658.17, AIC = 15506.21. Unstandardized path coefficients for the ACLP are reported in Table 5.

Table 5.

Initial Exploratory Autoregressive Cross-Lagged Panel Model

	Unstd. Coefficient Estimate	<i>S.E.</i>	<i>z</i> -value	<i>p</i> -value
Autoregressive Stability				
Derailment, W1 to 2	.67	.03	19.47	< .001
Derailment, W2 to 3	.77	.04	20.87	< .001
Derailment, W3 to 4	.68	.04	18.13	< .001
Depression, W1 to 2	.85	.04	21.30	< .001
Depression, W2 to 3	.83	.03	25.29	< .001
Depression, W3 to 4	.93	.05	20.45	< .001
Crossed Effects				
Derailment W1 predicts Depression W2	.615	.40	1.53	.125
Derailment W2 predicts Depression W3	-.619	.40	-1.54	.124
Derailment W3 predicts Depression W4	-.221	.58	-0.38	.703
Depression W1 predicts Derailment W2	.010	.004	2.82	.005
Depression W2 predicts Derailment W3	.001	.003	0.19	.846
Depression W3 predicts Derailment W4	.009	.003	2.75	.006
Covariances				
Derailment W1 with Depression W1	.86	.16	5.45	< .001
Derailment W2 with Depression W2	.49	.13	3.80	< .001
Derailment W3 with Depression W3	.25	.11	2.30	.022
Derailment W4 with Depression W4	.26	.15	1.74	.082
Intercepts				
Derailment W1	3.23	.02	142.02	< .001
Derailment W2	0.92	.11	8.31	< .001
Derailment W3	0.76	.11	6.78	< .001
Derailment W4	0.92	.12	7.80	< .001
Depression W1	7.51	0.24	31.32	< .001
Depression W2	0.82	1.30	0.63	.530
Depression W3	2.30	1.21	1.90	.058
Depression W4	2.85	1.80	1.57	.115
Variances				
Derailment W1	0.41	.021	19.74	< .001
Derailment W2	0.24	.016	15.32	< .001
Derailment W3	0.19	.015	12.90	< .001
Derailment W4	0.16	.014	11.85	< .001
Depression W1	44.47	2.29	19.46	< .001
Depression W2	31.32	2.08	15.07	< .001
Depression W3	19.69	1.61	12.23	< .001
Depression W4	35.07	3.07	11.44	< .001

Bivariate Latent Growth Curve. At the suggestion of a consultant (P. Curran, personal communication, July 9-19, 2017) given the issues with fitting the original ALT-SR model, a

standard bivariate latent growth curve (bivariate LGC) was also constructed to examine the parallel growth of both depression and derailment over time. The main difference between the ALT-SR and a bivariate LGC is the presence of structured crossover effects. In the bivariate LGC, the latent components and residuals between the two variables are allowed to covary but there are no predictions from one variable to the other.

In the bivariate LGC, derailment's slope factor was again excluded from the model, but the other latent components (derailment's intercept, depression's intercept, and depression's slope) were allowed to covary. Like all latent growth models, the means of the four manifest depression and derailment scores were fixed to zero, and the variance components of these manifests were constrained to equate over time. The covariances among the residuals of depression and derailment at each wave were constrained to be equate over time as well. This bivariate LGC evidenced largely acceptable model fit statistics. Although the chi-square test of global fit was significant ($\chi^2[26] = 71.41, p < .001$), other indices of fit reached acceptable thresholds: CFI = .98, TLI = .97; SRMR = .05; RMSEA = .05, 90% CI [.03, 0.06], $p_{\text{Close}} = .716$; BIC = 15509.92, AIC = 15452.75.

With regard to the specific unstandardized parameter values, the only significant covariance between depression and derailment's latent structure was between depression's intercept and derailment's intercept ($\psi_{is} = 0.89, SE = 0.14, p < .001$). This positive covariance indicates that those with higher initial starting derailment scores tended to have higher initial starting depression scores as well. Derailment's intercept factor evidenced significant mean ($\hat{\mu}_i = 3.23, SE = 0.20$) and variance ($\hat{\psi}_i = 0.29, SE = 0.02$) estimates, indicating an average non-zero starting value for derailment coupled with potentially non-trivial variance around that starting value. Although depression's intercept value evidenced similarly significant mean ($\hat{\mu}_i = 7.50, SE$

= 0.24) and variance ($\widehat{\psi}_t = 28.81$, $SE = 2.74$) estimates, its slope component did not ($\widehat{\mu}_s = .39$, $SE = 0.43$, $p = .371$; $\widehat{\psi}_s = 2.09$, $SE = 1.18$, $p = .077$). The covariation between the residual components of depression and derailment was significant ($cov = .17$, $SE = .05$, $p = .001$).

Finally, with regard to the specific regressions among the manifest variables, depression was only found to significantly predict itself from Wave 1 to Wave 2 ($b = .16$, $SE = .06$, $p = .009$). Derailment, on the other hand, evidenced significant and *negative* prediction of itself from Wave 1 to Wave 2 ($b = -.02$, $SE = .01$, $p = .007$). All other time-adjacent auto-regressions fell above thresholds for significance (all remaining p 's $\geq .08$).

Empirically-directed Respecification Attempts. Following the modification indices for the respective models, the ALT-SR and the ACLP were respecified. This was done in an effort to ascertain better-fitting models, respectively.

ALT-SR. With regard to the ALT-SR, the modification indices of the original model were again consulted. Among the latent components that were presenting as an issue for the growth of derailment, freeing the derailment's Wave 1 intercept appeared to be the most parsimonious way to improve overall model fit. Noting that derailment's trajectory was problematic, *how* to free derailment's Wave 1 intercept was determined with a series of latent growth models comparing fit and examining the plots of the estimated trajectories against the actual observed means. A visualization overlaying the various latent growth curves over the individual derailment trajectories can be found in Figure 4.

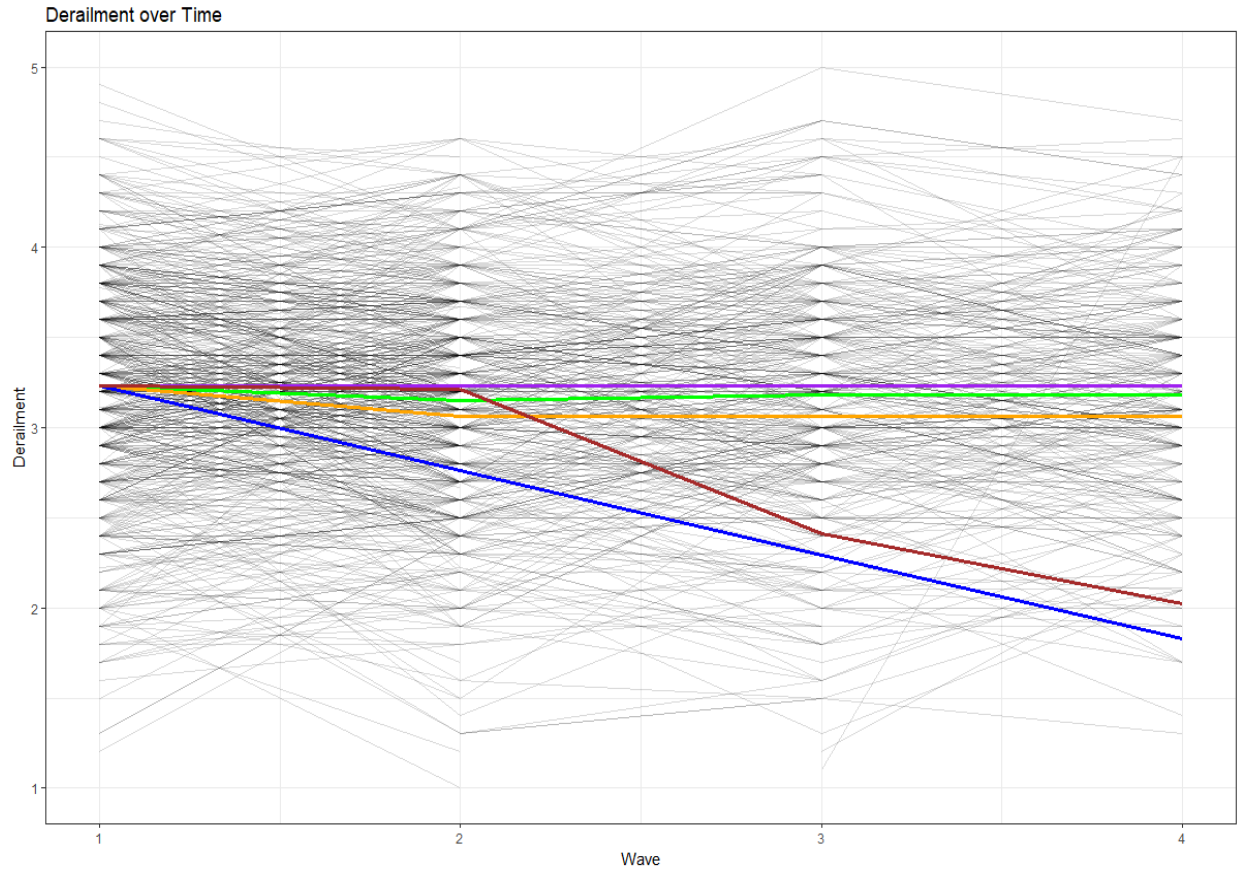


Figure 4. Latent Growth Curves of Derailment's Trajectory. *Notes:* The **green** line represents the observed means, the **purple** line represents means estimated from an intercept-only model, the **orange** line represent means estimated from a model with a knot-point at Wave 1, the **maroon** line represents the estimated means from a latent basis model, and the **blue** line represents the means estimated from a linear model.

From the plots, it became clear that the intercept-only and the trajectory including a knot-point between Waves 1 and 2 (created by a second slope factor with loadings at $\lambda_t = 1, 0, 0, 0$) were the closest-matching to the actual observed means of derailment across the study. To determine which trajectory was most appropriate, a series of Likelihood Ratio Tests (LRTs) were conducted with various knot-points evaluated against the intercept-only model. This testing of various trajectory fits can be found in Table 6.

Table 6.

Derailment intercept-only and knot model comparisons.

Model	BIC (AIC)	χ^2	χ^2_{Δ} Preceding Model	χ^2_{Δ} Intercept-only
Intercept-Only	3114.13 (3085.64)	22.28(8), $p = .004$		
Knot between W1 and W2	3114.32 (3071.58)	2.23(5), $p = .817$	20.05(3), $p < .001$	
Knot between W2 and W3	3127.77 (3085.04)	15.68(5), $p = .008$	13.45(0), $p < .001^+$	6.60(3), $p = .086$
Knot between W3 and W4	3129.23 (3086.49)	17.14(5), $p = .004$	1.46(0), $p < .001^+$	5.14(3), $p = .162$

Notes. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Chi-square change implies change from immediately preceding model.

⁺ indicates that the model fits significantly different, *but worse* than specified or preceding model.

From this exploration of derailment's trajectory, it became clear that a model featuring a knot-point between Waves 1 and 2 was the best-fitting solution for derailment's course.

Derailment's average trajectory appeared to begin relatively elevated. A decrease was observed from Waves 1 to 2, but then from Waves 2 through 4, the trajectory of derailment appeared rather stable. With this new knot-point representing a viable slope factor, the ALT-SR was reconstructed. Initially, allowing the variance components of the new derailment knotted trajectory resulted in a model with a non-positive-definite variance-covariance matrix. The variance of the derailment knotted slope component was then constrained to zero as a result. The linear model for depression was retained, and the variance components of depression's intercept and slope remained fixed to zero. The resultant model evidenced adequate overall model fit:

$\chi^2(15) = 57.77$, $p < .001$; CFI = .98, TLI = .96; SRMR = .06; RMSEA = .06, 90% CI [.04, 0.07], $p_{\text{Close}} = .189$; BIC = 15570.50, AIC = 15432.79.

Table 7.

Modified Autoregressive Latent Trajectory Model with Structured Residuals

	Unstd. Coefficient Estimate	S.E.	z-value	p-value
Autoregressive Stability				
Derailment, W1 to 2	.09	.04	2.51	.012
Derailment, W2 to 3	.11	.04	2.90	.004
Derailment, W3 to 4	.09	.04	2.48	.013
Depression, W1 to 2	.84	.04	21.03	< .001
Depression, W2 to 3	.83	.03	25.53	< .001
Depression, W3 to 4	.92	.05	20.21	< .001
Crossed Effects				
Derailment W1 predicts Depression W2	-.60	.17	-3.51	< .001
Derailment W2 predicts Depression W3	-.67	.27	-2.46	.014
Derailment W3 predicts Depression W4	.67	.39	1.71	.087
Depression W1 predicts Derailment W2	.02	.004	5.10	< .001
Depression W2 predicts Derailment W3	.01	.003	3.86	< .001
Depression W3 predicts Derailment W4	.02	.003	5.89	< .001
Covariances				
Derailment W1 with Depression W1	.77	.15	5.30	< .001
Derailment W2 with Depression W2	.54	.13	4.30	< .001
Derailment W3 with Depression W3	.24	.11	2.21	.027
Derailment W4 with Depression W4	.27	.14	1.93	.053
Intercepts				
Derailment Intercept	2.73	.02	23.82	< .001
*Derailment Knot Slope	.50	.02	4.34	< .001
Depression Intercept	7.40	.24	31.04	< .001
Depression Slope	-2.48	.40	-6.13	< .001
Variances				
Derailment Intercept	.22	.02	10.64	< .001
*Derailment Knotted Slope	0.0			
Derailment W1	.19	.02	11.83	< .001
Derailment W2	.14	.01	10.31	< .001
Derailment W3	.13	.01	9.30	< .001
Derailment W4	.10	.01	8.57	< .001
Depression Intercept	0.0			
Depression Slope	0.0			
Depression W1	44.53	2.29	19.43	< .001
Depression W2	31.94	2.12	15.05	< .001
Depression W3	19.68	1.61	12.23	< .001
Depression W4	35.44	3.11	11.41	< .001

Notes. All estimates are unstandardized. W = Wave.

* Denotes added parameter that deviates from the preregistration.

Given that this is an empirically-driven respecification of the model, the results of this model should be interpreted as entirely exploratory in nature; however, the coefficients estimated here were still evaluated and interpreted with the study hypotheses in mind. Further, given that this model is still an ALT-SR, the interpretation of the prospective paths are evaluated at the *within*-person level. Hence, directional path estimates represent whether an individual's deviation from his or her own average score at time_k can predict subsequent deviation at time_{k+1}.

Concerning the latent matrix, covariances between depression and derailment's intercept and slope parameters were not observed. With the exception of derailment's intercept variance, all other variance parameters were fixed to zero to preclude a non-positive definite matrix. Hence, the covariances among the parameters were all inherently zero (since anything multiplied by zero is zero). As the only remaining parameter observed, derailment's intercept variance was indeed significant ($\widehat{\psi}_t = 0.22$, $SE = 0.02$) indicating potentially meaningful variability around the average start-point. With regard to the means of the estimated latent variables, both derailment's intercept ($\widehat{\mu}_t = 2.73$, $SE = 0.02$) and slope ($\widehat{\mu}_s = 0.50$, $SE = 0.02$), as well as depression's intercept ($\widehat{\mu}_t = 7.40$, $SE = 0.24$) and slope ($\widehat{\mu}_s = -2.48$, $SE = 0.40$) were significant. Hence, with regard to derailment, participant scores evidenced a significant average non-zero starting value and a significant average slope from Wave 1 to Wave 2. Similarly, with regard to depression, participant scores evidenced a significant average non-zero starting value and a significant average slope across the study.

With regard to certain path coefficients, the residuals of both depression and derailment evidenced significant autoregressive stability over time. That is, deviations from one's mean trajectory of depression and derailment were able to significantly and positively predict successive deviations, respectively, from one observation to the next. Further, depression and

derailment evidenced significant and positive covariation when evaluated cross-sectionally at most waves. Thus, an individual who tended to be high on derailment relative to their own mean derailment score, also tended to be elevated on depression relative to their own mean depression score. Finally, with regard to the crossed effects, derailment significantly and *negatively* predicted depression between Waves 1 and 2, and Waves 2 and 3. From Wave 3 to Wave 4, however, the prediction was not significant. With respect to depression's capacity to predict derailment downstream, depression significantly and positively predicted derailment from each observation to the next.

ACLP. With regard to the ACLP respecification, nonsensical (e.g., an earlier time point being predicted by a later time point) regression parameters and covariances suggested in the modification indices were skipped. The remaining modification indices pointed to the addition of longer lags being needed in the model. In total, four additional lagged regressions were added to force the model to fit adequately: Derailment at Wave 4 being predicted by derailment at both Waves 1 and 2, Derailment at Wave 3 being predicted by derailment at Wave 1, and Depression at Wave 4 being predicted by Depression at Wave 2. With these additions, the model fit the data well: $\chi^2(8) = 16.08$, $p = .041$; CFI = 1.00, TLI = .98; SRMR = .02; RMSEA = .03, 90% CI [.01, 0.06], $p_{\text{Close}} = .838$; BIC = 15576.05, AIC = 15405.10. Table 8 displays the individual path coefficients of this revised model.

Again, given the exploratory nature of this respecification, the paths here must be interpreted cautiously. Further, because residual values are not specified within the ACLP framework, the effects here must be interpreted as average, or *between-person*, effects.

Table 8.

Modified Exploratory Autoregressive Cross-Lagged Panel Model

	Unstd. Coefficient Estimate	S.E.	z-value	p-value
Autoregressive Stability				
Derailment, W1 to 2	.65	.04	16.56	< .001
Derailment, W2 to 3	.56	.05	10.74	< .001
Derailment, W3 to 4	.36	.06	6.01	< .001
*Derailment, W2 to 4	.29	.05	4.72	< .001
*Derailment, W1 to 3	.28	.05	5.54	< .001
*Derailment, W1 to 4	.17	.05	3.36	.001
Depression, W1 to 2	.85	.04	21.40	< .001
Depression, W2 to 3	.81	.03	23.78	< .001
Depression, W3 to 4	.55	.08	6.26	< .001
*Depression, W2 to 4	.46	.09	5.29	< .001
Crossed Effects				
Derailment W1 predicts Depression W2	.57	.40	1.43	.154
Derailment W2 predicts Depression W3	-.54	.42	-1.28	.199
Derailment W3 predicts Depression W4	-.80	.58	-1.37	.169
Depression W1 predicts Derailment W2	.01	.004	2.77	< .001
Depression W2 predicts Derailment W3	.00	.003	0.35	.727
Depression W3 predicts Derailment W4	.01	.003	2.78	.005
Covariances				
Derailment W1 with Depression W1	.85	.16	5.40	< .001
Derailment W2 with Depression W2	.51	.13	3.80	< .001
Derailment W3 with Depression W3	.21	.11	1.86	.063
Derailment W4 with Depression W4	.23	.13	1.74	.082
Intercepts				
Derailment W1	3.23	.02	142.56	< .001
Derailment W2	0.99	.11	8.72	< .001
Derailment W3	0.51	.12	4.14	< .001
Derailment W4	0.49	.13	3.94	< .001
Depression W1	7.51	0.23	31.36	< .001
Depression W2	0.96	1.29	0.74	.458
Depression W3	2.18	1.25	1.75	.081
Depression W4	3.44	1.78	1.93	.054
Variances				
Derailment W1	0.41	.021	19.77	< .001
Derailment W2	0.24	.016	15.07	< .001
Derailment W3	0.18	.014	12.54	< .001
Derailment W4	0.14	.012	11.92	< .001
Depression W1	44.43	2.28	19.48	< .001
Depression W2	31.46	2.09	15.09	< .001
Depression W3	20.04	1.67	12.02	< .001
Depression W4	33.23	2.89	11.52	< .001

Notes. * Denotes added lag.

In the modified ACLP, both depression and derailment again evidenced significant and positive autoregressive stability indicating, once again, that the group mean at one observation significantly and positively predicts its location at the next observation. With regard to their covariation, the relations between depression and derailment at Waves 1 and 2 were both significant and positive. While the covariations at Waves 3 and 4 remained positive, the trend does not reach traditional significance thresholds. Finally, the crossed effects indicated that derailment did not significantly predict depression downstream across any time-adjacent observations. Depression, however, significantly and positively predicted downstream derailment from Waves 1 to 2, and from Waves 3 to 4.

DISCUSSION

The intent of the present study was binary in nature. First, this study sought to replicate and expound upon the findings of Burrow, Hill, Ratner, and Fuller-Rowell (2017) by showing that the experience of derailment can reliably predict subsequent depressive symptomatology. Second, this study questioned whether depression could then, in turn, predict derailment. If true, a depression-derailment feedback loop would be established. Providing a backdrop for the cyclical nature of these two constructs was also the notion of college matriculation as a time for the dynamic interplay of well-being and ongoing self-refinement. With these contextual circumstances in mind, a depression-derailment feedback loop could bring with it several implications. Not only would researchers have new insight into the development and maintenance of depression, but exciting new targets for future intervention would also be made visible. This new information could be especially helpful for those interested in facilitating individuals through critical life transitions.

The first major contribution of the current work concerns derailment. The present study was the first to observe derailment beyond two occasions, allowing for a more detailed picture of derailment's course. Contrary to expectations, derailment did not follow a linear trajectory whereby phenomena show consistent increase or decrease over time. Instead, the best-fitting model for derailment was one with a change in the trajectory over the period of observation: The average person in this study appeared to experience a slight decrease in derailment during the first semester of the academic year, followed by a plateau. One explanation for why this occurred is derived from the meaning maintenance model (MMM; Heine, Proulx, & Vohs, 2006). The MMM posits that when presented with unexpected information, individuals act quickly to project meaning onto accessible areas in a restorative process known as fluid compensation. When an

individual enters college, or begins a new academic year, their experience may not conform to expectations. Indeed, leaving home for the first time, or returning to college after spending nearly three months at home, can be a jarring experience. Thus, derailment may be highest immediately after arriving to campus. In an effort to restore meaning, people may cast sense onto their feelings of identity and the perceived continuity thereof. Once a period of adjustment has passed, one may expect no further fluctuations in derailment for the average person because there are no longer violations in their expectancies. No matter the mechanism, knowing that a traditional linear model is *not* ideal for the trajectory of derailment over time is an important first step for the scholarly community toward continuing to build derailment's theoretical framework.

With regard to depression's univariate trajectory, very little change was observed for the average person across the study. This relative stability of untreated depressive symptoms has been observed in prior literature on the topic (Lovibond, 1998; Tanaka & Huba, 1987; Tram & Cole, 2006). Further, the descriptive statistics of depression across the sample indicated that the vast majority of scores were well-within the range of normal mood fluctuation. Although a positively-trending linear growth function was the best-fitting type of growth for depression (indicating that, on average, an individual tends to experience more depressive symptoms with the passage of time), this slope component failed to reach the threshold for significance. Reasons for this could include the fact that data for the present study were collected at the beginning and end of two sequential college semesters which included final exams. During exam periods, an uptick in "depressive-like" symptoms is reasonable. Experiences such as loss of sleep, changes in appetite, and feelings of worthlessness could all be products of the stress felt when exams are approaching. Hence, a stable, but modestly positive, trend for the depressive symptoms is unsurprising.

Because this work was the first to chart derailment's course, the original model as it was preregistered (i.e., with derailment containing a linear slope component) was not viable. In order to answer the questions posed by this thesis, however, an exploratory respecified ALT-SR model was called upon to tentatively discuss the study's hypotheses. First, it was hypothesized that both depression and derailment would evidence significant stability over the course of the study and, indeed, initial evidence for this hypothesis was found. That is, both depression and derailment reliably predicted themselves from one wave to the next. Second, it was hypothesized that depression and derailment would significantly and positively be associated with one another at each observation. Indeed, within-wave, depression and derailment were significantly and positively related. This was true across the study with the exception of Wave 4, where the association between depression and derailment fell short of statistical significance. Importantly, since these tests were completed at the within-person level of analysis, the substantive interpretation of these findings suggests that for any given individual relative to their own mean trajectory of either depression or derailment, (a) elevated levels of one construct were able to predict elevated levels of the same construct at subsequent waves and (b) elevated levels of one construct were able to positively predict elevated levels of the other construct within the same wave. By and large, these findings support the first set of hypotheses purported at the outset of this paper. All in all, evidence is so far consistent with many of the studies presented in Burrow, Hill, Ratner, & Fuller-Rowell (2017): Derailment, as a measure, not only demonstrates test-retest reliability, but sensing derailment tends to be associated with experiencing more depressive symptoms at the same point in time.

Next, the crossed effects for depression and derailment over time were evaluated to test the reciprocal hypotheses. First, it was evaluated whether depressive symptoms predicted

subsequent and contiguous levels of derailment. It was hypothesized that the prospective association between depression and derailment would be positive and significant in nature. Across all time-adjacent waves of the study, depression indeed significantly and positively predicted successive reporting of derailment. These results are bolstered by the within-person nature of the analyses because systematic relations between depression and derailment are controlled in the ALT-SR model. In other words, these prospective relations between the variables are *not* simply due to between-person differences in rank-order; rather, these are average, time-specific deviations from individuals' norms (Berry & Willoughby, 2016). Within the proposed framework, this translates to preliminary evidence that being higher than one normally is with regard to depressive symptoms predicts that one tends to feel like they are more off-course than usual at a later point in time. These findings, although exploratory, leverage support for the claim that derailment is sensitive to the experience of increased depressive symptoms.

Finally, with respect to the conceptual replication of Burrow, Hill, Ratner, and Fuller-Rowell (2017) and the final piece to the proposed depression-derailment feedback loop, it was hypothesized that derailment would positively predict subsequent depression. While derailment was able to significantly predict depression from Waves 1 to 2, and 2 to 3 in the present study, the prospective associations were *negative*. That is, for an individual scoring relatively high on derailment at a given time point, their subsequent level of depression tended to be relatively low. In the final crossed effect for this association, the prospective relation between derailment at Wave 3 and depression at Wave 4 was positive, although, this estimate was not statistically significant.

Overall, these findings on the prospective association between derailment and depression are not only unexpected, but in direct opposition to that which was purported by Burrow and his colleagues (2017). Several possibilities could explain these discrepant findings. For one, this disagreement could be attributable to the differences between the studies in unit of time. Burrow and his colleagues used a lag of nine months whereas the present study's lag was only around three months between observations. A longer period of time may be needed for derailment to positively predict depressive symptoms. Another possible explanation for this discrepancy is offered by King and Hicks (2007). The idea of possible selves (Markus & Nurius, 1986) is arguably a near-neighbor of derailment – if derailment is the sense that one has gotten “off course,” then that lost course must be cognitively represented in some way by the person who senses derailment. Remaining engaged with a lost possible self tends to be related to negative well-being correlates like regret and distress (King & Raspin, 2004; King & Smith, 2004; Wrosch, Bauer, & Scheier, 2005), but King and Hicks contend that lost possible selves offer a fallow space for formative opportunities. In earlier studies, elaborating on a lost possible self was related to heightened ego development (King & Smith, 2004) and sensed growth (King & Patterson, 2000) – components that King and Hicks suggest are important for maturity, complexity, and happiness. These ideas are not without merit: For decades, it has been noted that the ability to be reasonably flexible with one's goals is ideal for subjective well-being (Klinger, 1975, 1977), and disengagement from dead ends can be associated with lower regret intensity (Wrosch et al., 2005). Although painful at first, being able to “cut one's losses” is an important first step toward commitment to new, more plausible goals and subsequent well-being. This process of disengagement and recovery is perhaps expedited within the college environment, where opportunities for individuals to conjure new possible selves are abound, ergo, blunting

derailment's deleterious effects. Indeed, from King and Hicks' perspective, "The happy and complex person acknowledges fully a past characterized by loss but is also deeply engaged in the present" (p. 630). This possible explanation for the curious inverse effect of derailment on subsequent depressive symptoms opens several doors for future research, to be discussed shortly.

Limitations

Insofar as the confirmatory tests of the present study, testing and interpreting the feedback model as it was originally proposed gave rise to several issues. Ultimately, modification indices were used to ascertain the derailment trajectory since no work to date has examined derailment beyond two time points. Although following the suggestions of modification indices can lead researchers to a better-fitting model, it is important to keep in mind that such guidance is at the expense of Type I error control (Kline, 2015). Modification indices are derived in a sequential, data-dependent manner, resulting in suggestions that contain dozens of error potentials. Thus, corrections for Type I error inflation after turning to modification indices in a structural equation model "...are really just Band-Aids on flesh wounds" (F. Thoemmes, personal communication, August 20, 2017). Given that psychological findings are laden with false positives (Ioannidis, 2005; Simmons, Nelson, & Simonsohn, 2011), it would be reckless not to underscore the need for replication of the presented model. Readers should interpret the present study's findings as exploratory in nature, but still instrumental to laying down the foundation to this field of inquiry. If researchers are interested in the premise of this model, confirmatory studies must be conducted before any theory surrounding the association between depression and derailment can truly advance.

Moreover, future researchers should consider replicating the present study using a sample that contains clinical participants or, at the very least, a sample of individuals that represent a

broader range of depressive symptoms. As evidenced by the histograms, depression scores were quite positively skewed. With data that is so densely populated at the lower range of depression scores, it is possible that the present study suffers from a statistical limitation known as restriction of range. This restriction of range could very well result in the suppression of correlates (e.g., Sackett & Yang, 2000), in addition to providing a murky picture of what the relation between depression and derailment looks like at the uppermost levels of depression.

A third limitation of the present study is one that is inherent to most – if not all – longitudinal designs (Graham, 2009), yet is still consistently under-addressed in the field of developmental psychology (Nicholson, Deboeck, Howard, 2017). Between Wave 1 and Wave 4, this study experienced roughly 56% attrition at the measurement-occasion level (i.e., participants at the beginning of the study who did not return for subsequent waves). Given this high rate of attrition, some explanation of missing data mechanisms is warranted. Why data are missing can bias the present study's results (Little & Rubin, 1989) just as much as those who enroll/stay in longitudinal studies can leave researchers vulnerable to bias as a result of non-random self-selection (Goodman & Blum, 1996; Rubin, 1976). Little and Rubin (1989) describe three ways data comes to be missing. First, data can be missing completely at random (MCAR), whereby missingness is not related to any variable that is observed or unobserved (e.g., a research assistant drops a set of responses on the way to code them). Second, data can be missing at random (MAR) whereby missingness can be explained by a variable that is observed elsewhere in the data (e.g., conscientiousness [if personality traits are being observed on the survey] can predict those who accidentally skip other items in the survey). Finally, data can be missing not at random (MNAR), whereby missingness on a given item is driven by the item content itself (e.g., a participant with a high body mass index fails to fill out questions relevant to their height and

weight), or when the correlate of the missingness is otherwise unknown or simply not measured. Under conditions of MCAR and MAR, missing data methods like Multiple Imputation and Full Information Likelihood Estimation can help attenuate bias; however, under conditions of MNAR, unbiased parameter estimates can never be achieved because the correlate of the missingness can never be accounted for in the analysis (Enders, 2010). It is entirely possible that students who were the most depressed were those who either (a) did not enroll in the study, (b) did not return to the study, or (c) skipped some/all depression items. It is also possible that because data collection occurred during peak times of activity in the semester (i.e., at the beginning, when students are still adjusting to their schedules, and at the end, when students are preparing for final exams) many students simply did not have time, were simply too stressed, or not incentivized enough to participate in non-class activities. Thus, the present study's missing data mechanism could very well be MNAR since there is no accounting for these potential correlates. With all this being said, there is hope in the fact that missing data is often due to a combination of mechanisms within a single dataset (Graham, 2012). If this is true for the present dataset, the chosen method of estimation (Full Information Likelihood) could mitigate the biases resulting from cases that are truly MCAR or MAR. No matter the true mechanism, this study is still a viable attempt at observing the effects it set out to test. Beyond being key to beginning a conversation about how mental health can impose on global processes like identity and perceived self-continuity, the present study's results could still be valuable for replication attempts, especially for those who are interested in testing more highly powered and complex models (e.g., latent change score models; McArdle, 2009) that may necessitate parameter starting values.

Finally, it is possible that MNAR data could be forestalled in future studies if data were collected from a variety of sources rather than relying solely on self-report methods. This

possibility leads to the fourth limitation of the current work: Overreliance on self-report methods. Using only one method of data collection makes researchers susceptible to errors arising as a result of common method variance (Williams & Brown, 1994) and biases such as self-enhancement (e.g., Taylor, 1989). Although self-report methods are popular, convenient, and generally reliable methods of assessment (Vazire, 2006), informant-reports represent a reasonable alternative to data collection should researchers wish to prevent the possible introduction of bias (Olino & Klein, 2015). Given the nature of this study, however, yet another alternative to self-report data collection would be if questionnaires or structured interviews were administered by trained clinical professionals. In practice, the Beck Depression Inventory (Beck et al., 1996) is among the most commonly used tools to quantitatively assess depressive symptoms; however, several other interviewer-administered tools are available to assess depression (e.g., Mini-International Neuropsychiatric Interview; Sheehan et al., 1998; Structured Clinical Interview for the DSM-5; First, Williams, Karg, & Spitzer, 2015). As conceptualized by Burrow and his colleagues (2017), derailment has some clinical implications and it is therefore possible that assessments of derailment could be transformed into formats that are better suited for use in practice. If this is the case, more avenues would be made available for researchers to continue to test and assess the depression-derailment dynamic using methods other than self-report.

Future Directions

Including the need for replication of the present study, several routes for future research are inspired by the findings at hand. First, identifying possible moderators could represent many next steps. For example, in the present study, derailment's trajectory was shown to be best captured by a knot function whereby derailment was relatively high at the beginning of the

academic year, but then stabilized at a lower level as the year continued. What is yet to be discovered is if this knot trajectory is common across students from other universities, consistent across years of college, and if this knot trajectory is observed in non-student populations. That is, whether this knot exists across all emerging adults equally is a testable question for future research. Maybe it is the case that the college environment inherently contains stabilizing properties best-equipped to temper those highest on derailment. Testing the knot trajectory across a variety of contexts will be able to clue theorists into the generalizability of these findings, and if there are periods of the life span where we tend to observe more volatility in derailment than others. If, for example, a knot only tends to be apparent in student populations, future work testing interventions targeting derailment might find that they are best suited for those embarking on new chapters of their lives.

Taken together, the findings invite questions regarding the nuances of derailment and its outcomes. Given the unexpected negative prospective relation between derailment and depression found in the present study, future investigation is needed to understand why these results deviate from previous findings that mark derailment as a signal of dysfunction. Clear from the results presented here is that derailment may not ubiquitously predict negative outcomes. Perhaps derailment can have two sides based on valence – could there be both “good” and “bad” types of derailment? People who feel as though they have changed for the better tend to have lower net well-being than those who report relative self-stability (e.g., Keyes, 2000), though that is not to say that those who do, in fact, feel like they are changing for the better are on a path toward debilitation. It is reasonable then to question if a “good” type of derailment could be beneficial or motivating – rather than distressing – to individuals. If derailment does possess salutary effects, some may investigate if inducing derailment is advisable and under what

conditions this effect persists. For example, the sample at hand is exclusively college students. As such, is it a good thing to sense derailment in college versus other contexts? Also, are there times during college (e.g., freshman year versus other years) in which it is better to sense derailment than others, and are there ways we can call upon college counselors to help individuals in a developmentally-sensitive way? Moreover, derailment's ambiguity in terms of outcome inspires questions about the role of temporal precedence. If derailment does not always lead to negative outcomes, then perhaps it is the case at derailment *that results from first experiencing depression* is the type of derailment that can make one feel more ensnared and predict subsequent depression. That is, maybe it is only a feedback loop that begins with depression that can actually position one on a downward spiral. Indeed, depression tends to be more unequivocal in terms of the outcomes it precipitates. Future research on this front is necessary to determine if there are latent classes of individuals who follow certain trajectories of depression and derailment over longer periods of time, and if these trajectories can predict certain outcomes. All in all, research investigating such nuances of derailment might help to explain the discrepant results that are now present in the derailment-depression literature.

In yet another test of moderation, perhaps the depression-derailment feedback loop changes as a function of one's engagement with a lost possible self. If continuing to stay engaged with a lost possible self tends to be related to negative outcomes (King & Raspin, 2004; King & Smith, 2004; Wrosch et al., 2005) whereas disengagement from unattainable goals tends to be better for well-being (Klinger, 1975, 1977; Wrosch et al., 2005), maybe derailment only leads to depression in cases where there remains high salience or engagement with a lost possible self. As alluded to above, it may be easier to disengage from lost possible selves when there are many other possible selves to follow, like in the case of a young person beginning their journey

through college. Indeed, this is leveraged by statistics suggesting that nearly 75% of individuals will change their major at least once during their undergraduate career (Gordon, 1995) and over one-third of students enter college with an “undecided” major (Malgwi, Howe, & Bumaby, 2011).

Along a similar line of questioning, maybe the relation between derailment and depression is mediated by a process like rumination (the proclivity to persevere in negative thought; Nolen-Hoeksema, 1991). Rumination has been nominated as a causal influence on the development of depressive symptoms (Nolen-Hoeksema, 2000), and maybe individuals who go on to develop depression as a result of feeling as though they are derailed are actually doing so due to increased ruminative activity on the lost course. Rumination could also act as a moderator in that, for those low on rumination, the relation between derailment and subsequent depression is negative whereas for those who engage in high rumination, the relation between derailment and later depression is positive. If future research comes to favor the positive relation between derailment and successive depressive symptoms, on one hand, future researchers could dive into the psychometric properties of derailment versus scales of depression and rumination to investigate if these are distinguishable constructs. On the other hand, future researchers could launch qualitative or mixed-methods studies to investigate if individuals experiencing depression appear to be engaging in ruminative thought that has a derailment-like flair.

Ruminative tendencies, however, are not unique to depression (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Similarly, research questions focused on if and what role derailment plays in other clinical disorders is a promising route for researchers interested in the present work. The question to be answered here would be whether derailment can be conceptualized as a transdiagnostic process. Considering that self and identity figure prominently in other clinical

issues such as self-injury (Adam, Rodham, & Gavin, 2005; Breen, Lewis, & Sutherland, 2013), eating disorders (Corning & Heibel, 2016; Stanghellini, Castellini, Brogna, Faravelli, & Ricca, 2012; Verschueren et al., 2017), alcohol use (Chambers, Canvin, Baldwin, & Sinclair, 2017; Lindgren, Ramirez, Olin, & Neighbors, 2016; Montes, Dearing, Claus, & Witkiewitz, 2017), schizophrenia (Aakre, Klingaman, & Docherty, 2015; Boulanger, Dethier, Gendre, & Blairy, 2013), and bipolar disorder (Inder, Crowe, Moor, Luty, Carter, & Joyce, 2008), pursuits similar to the current study could be taken up to investigate if derailment shares a similar – or even more robust – association with these other disorders. If this is the case, perhaps greater attention will be given to identity, self-continuity, and other developmental processes in the context of the etiology, taxonomy, and treatment of mental disorders (Kaufman, Montgomery, & Crowell, 2014).

Conclusion

Depression is one of the most well-known, discussed, and prevalent mental health issues of the modern age (Hogg, 2011; Kessler et al., 2005; Rasmussen & Ewoldsen, 2013). Furthermore, emerging adulthood – and the college experience in particular – not only allows one to deeply consider self-related negotiations (Arnett, 2000, 2004), but also presents a pivotal life transition that leaves individuals vulnerable to the development of problematic thoughts and behaviors (e.g., Alfeld-Liro & Sigelman, 1998; Compas, Wagner, Slavin, & Vannatta, 1986; Dyson & Renk, 2006). Thus, understanding what may maintain and/or be spurred by depression is a preeminent task. The present study tested a novel claim about the relation between mental health and identity processes by attempting to establish a dynamic association between depressive symptoms and derailment. Although the present study did not conceptually support the earlier findings of Burrow and his colleagues (2017), a positive prospective relation was

found in the opposite direction of the effect whereby depression positively predicted derailment at subsequent waves. These findings suggest that depression might have some influence on the extent to which individuals sense stability when evaluating their life course. The present study opened several exciting doors for future research to investigate how and why derailment might share a nuanced association with depression and other mental health disorders. Further, this study builds upon burgeoning work suggesting that mental health can and does affect how we perceive ourselves (e.g., Cast & Welch, 2015; Cruwys & Gunaseelan, 2016; McGrath & Repetti, 2002). As literature continues to grow in this regard, it is hoped that the present study can contribute to a future of research where the theory and treatment of depression may be guided toward a more inclusive perspective, one that extends further than acute symptomatology. With a more holistic approach to depression's formulation and effects, as well as a sense for when in the lifespan one's identity and self-stability are most sensitive to mental health concerns, it is hoped that a more contextualized view of the human experience can begin to take shape.

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APPENDIX A: SURVEY INSTRUMENT

DS - INSTRUCTIONS

Please take some time to read each statement carefully and decide the extent to which you agree with each statement on the scale provided. For each set of questions, use the scale that **precedes** the set.

A	B	C	D	E
Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree

1. I am surprised at who I have become.
2. Sometimes I notice how different I am now from who I used to be.
3. I did not anticipate becoming the person that I currently am.
4. I feel like I have always been the same person that I am today.
5. I feel like I've become a different type of person over time.
6. How I saw myself in the past is different from how I see myself now.
7. I see myself now as the person I always thought I'd be.
8. My life has been heading in the same direction for a long time.
9. My motivations in life have been the same over time.
10. I do not feel very connected to who I was in the past.

BDI - INSTRUCTIONS

Please read each group of statements carefully and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. If several statements in the group seem to apply equally well, circle the statement which appears the furthest down on the list for that group.

11. Sadness
 - A. I do not feel sad.
 - B. I feel sad much of the time.
 - C. I am sad all of the time.
 - D. I am so sad or unhappy that I can't stand it.
12. Pessimism
 - A. I am not discouraged about my future.
 - B. I feel more discouraged about my future than I used to be.
 - C. I do not expect things to work out for me.
 - D. I feel my future is hopeless and will only get worse.
13. Past Failure
 - A. I do not feel like a failure.
 - B. I have failed more than I should have.
 - C. As I look back, I see a lot of failures.
 - D. I feel I am a total failure as a person.
14. Loss of Pleasure
 - A. I get as much pleasure as I ever did from things I enjoy.
 - B. I don't enjoy things as much as I used to.
 - C. I get very little pleasure from the things I used to enjoy.
 - D. I can't get any pleasure from the things I used to enjoy.
15. Guilty Feelings
 - A. I don't feel particularly guilty.
 - B. I feel guilty over many things I have done or should have done.
 - C. I feel quite guilty most of the time.
 - D. I feel guilty all of the time.

16. Punishment Feelings
- A. I don't feel I am being punished.
 - B. I feel I may be punished.
 - C. I expect to be punished.
 - D. I feel I am being punished.
17. Self-dislike
- A. I feel the same about myself as ever.
 - B. I have lost confidence in myself.
 - C. I am disappointed in myself.
 - D. I dislike myself.
18. Self-Criticalness
- A. I don't criticize or blame myself more than usual.
 - B. I am more critical of myself than I used to be.
 - C. I criticize myself for all my faults.
 - D. I blame myself for everything bad that happens.
19. Suicidal Thoughts or Wishes
- A. I don't have any thoughts of killing myself.
 - B. I have thoughts of killing myself, but I would not carry them out.
 - C. I would like to kill myself.
 - D. I would kill myself if I had the chance.
20. Crying
- A. I don't cry any more than I used to.
 - B. I cry more than I used to.
 - C. I cry over every little thing.
 - D. I feel like crying, but I can't.
21. Agitation
- A. I am no more restless or wound up than usual.
 - B. I feel more restless or wound up than usual.
 - C. I am so restless or agitated that it's hard to stay still.
 - D. I am so restless or agitated that I have to keep moving or doing something.
22. Loss of Interest
- A. I have not lost interest in other people or activities.
 - B. I am less interested in other people or things than before.
 - C. I have lost most of my interest in other people or things.
 - D. It's hard to get interested in anything.
23. Worthlessness
- A. I do not feel I am worthless.
 - B. I don't consider myself as worthwhile and useful as I used to.
 - C. I feel more worthless as compared to other people.
 - D. I feel utterly worthless.
24. Indecisiveness
- A. I make decisions about as well as ever.
 - B. I find it more difficult to make decisions than usual.
 - C. I have much greater difficulty in making decisions than I used to.
 - D. I have trouble making any decisions.
25. Loss of Energy
- A. I have as much energy as ever.
 - B. I have less energy than I used to have.
 - C. I don't have enough energy to do very much.
 - D. I don't have enough energy to do anything.

26. Changes in Sleeping Pattern
- A. I have not experienced any change in my sleeping pattern.
 - B. I sleep somewhat more OR less than usual.
 - C. I sleep a lot more OR less than usual.
 - D. I either sleep most of the day OR wake up 1-2 hours early and can't get back to sleep.
27. Irritability
- A. I am no more irritable than usual.
 - B. I am more irritable than usual.
 - C. I am much more irritable than usual.
 - D. I am irritable all the time.
28. Changes in Appetite
- A. I have not experienced any change in my appetite.
 - B. My appetite is somewhat less OR greater than usual.
 - C. My appetite is much less OR greater than usual.
 - D. I either have no appetite at all OR I crave food all the time.
29. Concentration Difficulty
- A. I can concentrate as well as ever.
 - B. I can't concentrate as well as usual.
 - C. It's hard to keep my mind on anything for very long.
 - D. I find I can't concentrate on anything.
30. Tiredness or Fatigue
- A. I am no more tired or fatigued than usual.
 - B. I get more tired or fatigued more easily than usual.
 - C. I am too tired or fatigued to do a lot of the things I used to do.
 - D. I am too tired or fatigued to do most of the things I used to do.
31. Loss of Interest in Sex
- A. I have not noticed any recent change in my interest in sex.
 - B. I am less interested in sex than I used to be.
 - C. I am much less interested in sex now.
 - D. I have lost interest in sex completely.

R - INSTRUCTIONS

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you *generally* do, not what you think you should do. For each set of questions, use the scale that **precedes** the set.

A	B	C	D
Almost Never	Sometimes	Often	Almost Always

- 32. Think about how alone you feel
- 33. Think "I won't be able to do my job if I don't snap out of this"
- 34. Think about your feelings of fatigue and achiness
- 35. Think about how hard it is to concentrate
- 36. Think "What am I doing to deserve this?"
- 37. Think about how passive and unmotivated you feel
- 38. Analyze recent events to try to understand why you are depressed
- 39. Think about how you don't seem to feel anything anymore
- 40. Think "Why can't I get going?"
- 41. Think "Why do I always react this way?"

A Almost Never	B Sometimes	C Often	D Almost Always
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42. Go away by yourself and think about why you feel this way
43. Write down what you are thinking about and analyze it
44. Think about a recent situation, wishing it had gone better
45. Think "I won't be able to concentrate if I keep feeling this way."
46. Think "Why do I have problems other people don't have?"
47. Think "Why can't I handle things better?"
48. Think about how sad you feel
49. Think about all your shortcomings, failings, faults, mistakes
50. Think about how you don't feel up to doing anything
51. Analyze your personality to try to understand why you are depressed
52. Go someplace alone to think about your feelings
53. Think about how angry you are with yourself

DIDS - INSTRUCTIONS

Please rate the extent to which you agree or disagree with each of the following statements using the provided scale. For each set of questions, use the scale that **precedes** the set.

A Strongly Disagree	B Disagree	C Neither Agree nor Disagree	D Agree	E Strongly Agree
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54. I have decided on the direction I am going to follow in my life.
55. I have plans for what I am going to do in the future.
56. I know which direction I am going to follow in my life.
57. I have an image about what I am going to do in the future.
58. I have made a choice on what I am going to do with my life.
59. I think actively about different directions I might take in the future.
60. I think about different things I might do in the future.
61. I am considering a number of different lifestyles that might suit me.
62. I think about different goals that I might pursue.
63. I am thinking about different lifestyles that might be good for me.

LET - INSTRUCTIONS

Please take some time to read each statement carefully and decide the extent to which you agree with each statement on the scale provided. For each set of questions, use the scale that **precedes** the set.

A Strongly Disagree	B Slightly Disagree	C Neutral	D Slightly Agree	E Strongly Agree
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64. There is not enough purpose in my life.
65. To me, the things I do are all worthwhile.
66. Most of what I do seems trivial and unimportant to me.
67. I value my activities a lot.
68. I don't care very much about the things I do.
69. I have lots of reasons for living.

P - INSTRUCTIONS

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide to what extent you agree or disagree. For each set of questions, use the scale that **precedes** the set.

A	B	C	D	E	AB	AC
Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree

70. When I am working on something, I cannot relax until it is perfect.
71. One of my goals is to be perfect in everything I do.
72. I never aim for perfection on my work.
73. I seldom feel the need to be perfect.
74. I strive to be as perfect as I can be.
75. It is very important that I am perfect in everything I attempt.
76. I strive to be the best at everything I do.
77. I demand nothing less than perfection of myself.
78. It makes me uneasy to see an error in my work.
79. I am perfectionistic in setting my goals.
80. I must work to my full potential at all times.
81. I do not have to be the best at whatever I'm doing.
82. I do not have very high goals for myself.
83. Please select "Agree" (not "Strongly Agree" or "Somewhat Agree") to this statement and continue with the survey as usual.
84. I set very high standards for myself.
85. I must always be successful at school or work.

CFI - INSTRUCTIONS

Please use the scale below to indicate the extent to which you agree or disagree with the following statements. For each set of questions, use the scale that **precedes** the set.

A	B	C	D	E	AB	AC
Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree

86. I am good at "sizing up" situations.
87. I have a hard time making decisions when faced with difficult situations.
88. I consider multiple options before making a decision.
89. When I encounter difficult situations, I feel like I am losing control.
90. I like to look at difficult situations from any different angles.
91. I seek additional information not immediately available before attributing causes to behavior.
92. When encountering difficult situations, I become so stressed that I cannot think of a way to resolve the situation.
93. I try to think about things from another person's point of view.
94. I find it troublesome that there are so many different ways to deal with difficult situations.
95. I am good at putting myself in others' shoes.
96. When I encounter difficult situations, I just don't know what to do.

A	B	C	D	E	AB	AC
Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree

97. It is important to look at difficult situations from many angles.
98. When in difficult situations, I consider multiple options before deciding how to behave.
99. I often look at a situation from different viewpoints.
100. I am capable of overcoming the difficulties in life that I face.
101. I consider all the available facts and information when attributing causes to behavior.
102. I feel I have no power to change things in difficult situations.
103. When I encounter difficult situations, I stop and try to think of several ways to resolve it.
104. I can think of more than one way to resolve a difficult situation I'm confronted with.
105. I consider multiple options before responding to difficult situations.

BAI - INSTRUCTIONS

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the **past week, including today**. For each set of questions, use the scale that **precedes** the set.

A	B	C	D
Not at All	Mildly (Did not bother me much)	Moderately (Very unpleasant, but I could stand it)	Severely (I could barely stand it)

106. Numbness or tingling
107. Feeling Hot
108. Wobbliness in Legs
109. Unable to relax
110. Fear of the worst happening
111. Dizzy or lightheaded
112. Heart pounding or racing
113. Unsteady
114. Terrified
115. Nervous
116. Feelings of Choking
117. Hands trembling
118. Shaky
119. Fear of losing control
120. Difficulty breathing
121. Fear of dying
122. Scared
123. Indigestion or discomfort in abdomen
124. Faint
125. Face flushed
126. Sweating (not due to heat)

DEMOGRAPHICS - INSTRUCTIONS

Please select the most appropriate answer for you.

Please enter your NetID (Prefix of your Cornell email address before the "@" sign):

--

1. What is your biological sex?
 - A. Male
 - B. Female
 - C. Intersex
2. With which gender do you identify?
 - A. Man
 - B. Woman
 - C. Other

If you would like, please specify your gender identity below if you selected "Other" to the previous question:

3. What is your current age (in years)?:
4. What is your racial/ethnic background? Please circle all that apply.
 - A. White/Caucasian, non-Hispanic
 - B. Black/African-American, non-Hispanic
 - C. Asian/Asian-American or Pacific Islander
 - D. Hispanic or Latino/a
 - E. Native American or Alaskan Native
 - AB. Other
5. Please select your parents' highest level of education.

Mother:

 - A. Did not complete high school
 - B. High school diploma or equivalent
 - C. Some college, including vocational/technical school
 - D. Bachelor's degree
 - E. Graduate or Professional school

Father:

 - a. Did not complete high school
 - b. High school diploma or equivalent
 - c. Some college, including vocational/technical school
 - d. Bachelor's degree
 - e. Graduate or Professional school

6. Which college or school at Cornell are you currently enrolled in?
- A. College of Agriculture and Life Sciences (CALS)
 - B. College of Architecture, Art, and Planning (AAP)
 - C. College of Arts and Sciences (CAS)
 - D. College of Engineering
 - E. School of Hotel Administration (SHA)
 - AB. College of Human Ecology (CHE)
 - AC. School of Industrial and Labor Relations (ILR)
 - AD. Cornell Law School (LAW)
 - AE. Samuel Curtis Johnson Graduate School of Management (JOHNSON)
 - ABA. College of Veterinary Medicine
7. What year in school are you?
- A. 1st Year/Freshman
 - B. 2nd Year/Sophomore
 - C. 3rd Year/Junior
 - D. 4th Year/Senior
 - AB. 5+ Year
 - AC. Graduate Student
8. Is this year the first time that you are leaving home to attend college/university?
- A. Yes
 - B. No

If you selected “No” to the previous question, please **briefly** explain your circumstances below:
Example: “I am a returning Cornell Student.”

9. As of today, are you registered/enrolled as a Cornell student?
- A. Yes
 - B. No
10. If applicable, in which Residence Hall do you live?

APPENDIX B: IRB APPROVAL



Cornell University
Office of
Research Integrity and Assurance

East Hill Office Building, Suite 320
395 Pine Tree Road
Ithaca, NY 14850
p. 607-254-5162
f. 607-255-0758
www.irb.cornell.edu

Institutional Review Board for Human Participants

NOTICE OF EXPEDITED AMENDMENT APPROVAL

To: Kaylin Ratner
From: Carol Devine, IRB Chairperson
Protocol ID#: 1606006394
Protocol Title: The Cornell Experience Survey
Approval Date: April 06, 2017
Expiration Date: July 20, 2017

Cornell University's Institutional Review Board for Human Participants (IRB) has reviewed and approved the following change(s)/modification(s) to the previously approved protocol referenced above:

Please note the following:

- Amendment to add new compensation, and revise the consent form and follow-up emails, accordingly.

This approval shall remain in effect until July 20, 2017.

If you requested modifications to consent form(s), please use the attached revised/new consent form for any future subject enrollment.

If you submitted revised/final versions of interview guides, questionnaires, standard operating procedures, or any other research materials, you have approval to use those materials.

All other study procedures/instruments are to remain unchanged.

The following personnel are approved to perform research activities on this protocol:

- Kaylin Ratner
- Anthony Burrow
- Jane Mendle
- Alexander Perez
- Daniel Rosenfeld
- Emily Rosenthal
- Gregory Eells
- Hee Jin Jeon

- Janeil Dennis
- Julia Lesnick
- Kayla Burd
- Leslie Meyerhoff
- Madeline Ling
- Marne Einarson
- Mary Koch
- Taylor Beauvais

Please note the following important conditions of approval for this study:

1. All consent forms, records of study participation, and other consent materials **must** be held by the investigator for **five years** after the close of the study.
2. Investigators must submit to the IRB any **proposed amendment** to the study protocol, consent forms, interviews, recruiting strategies, and other materials. Investigators may not use these materials with human participants until receipt of written IRB approval for the amendment. For information about study amendment procedures and access to the Amendments application form, please refer to the IRB website: <http://www.irb.cornell.edu/forms>.
3. Investigators must promptly report to the IRB any **unexpected events** involving human participants. The definition of prompt reporting depends upon the seriousness of the unexpected event. For guidance on recognizing, defining, and reporting unexpected events to the IRB, please refer to the IRB website: <http://www.irb.cornell.edu/policy>.

If the use of human participants is to continue beyond the assigned approval period, the protocol must be re-reviewed and receive continuing approval. As the Principal Investigator it is your responsibility to obtain review and continued approval before the expiration date. Applications for renewal of approval must be submitted sufficiently in advance of the expiration date to permit the IRB to conduct its review before the current approval expires. Please allow three weeks for the review.

Any research-related activities -- including recruitment and/or consent of participants, research-related interventions, data collection, and analysis of identifiable data -- conducted during a period of lapsed approval is unapproved research and can never be reported or published as research data. If research-related activities occur during a lapse in the protocol approval, the activities become a research compliance issue and must be reported to the IRB via an unexpected event form (www.irb.cornell.edu/forms).

For questions related to this application or for IRB review procedures, please contact the IRB office at irbhp@cornell.edu or 255-6182. Visit the IRB website at www.irb.cornell.edu for policies, procedures, FAQs, forms, and other helpful information about Cornell's Human Participant Research Program. Please download the latest forms from the IRB website www.irb.cornell.edu/forms/ for each submission.

Cc: Anthony Burrow
Jane Mendle

APPENDIX C: CONSENT DOCUMENTS

Informed Consent

We are asking you to participate in Time 1 of a research study titled "The Cornell Experience Survey." We will describe this study to you and answer any of your questions.

This study is being led by Kaylin Ratner, Dr. Anthony Burrow, and Dr. Jane Mendle from the Department of Human Development at Cornell University. This study is being completed in collaboration with Cornell University Counseling and Psychological Services at Gannett, with support from the Dean of Students office and The Cornell Store.

What the study is about

The purpose of this research is to explore how well-being and psychological development are shaped by college.

What we will ask you to do

We will ask you to complete a survey containing demographic questions (9) and 126 statements (for example, "I enjoy making plans for the future and working to make them a reality.") to which you will respond by rating how much you agree with each statement on a 1 (strongly disagree) to 5 (strongly agree) scale or similar. You will be invited via email to complete this survey a total of four times over the course of your year here at Cornell University. Since this survey is longitudinal, it is **not anonymous**; however, your name/NetID will be assigned a caseID to protect your anonymity to the best of our abilities. Each survey battery is expected to take you approximately 15 minutes to complete.

Risks and discomforts

We do not anticipate any risks from participating in this research; however, you may find some of the questions to be sensitive/personal. With this said, we anticipate that your participation in this survey presents no greater risk than everyday use of the Internet.

Benefits

You will not benefit directly for taking part in this research, besides learning more about how research is conducted. With regard to possible indirect benefits, reflecting over the course of your year could help foster a better sense of self-understanding. Furthermore, our understanding of development over college could be used to help develop intervention programs for people in the future.

Compensation for participation

For your participation in this research study, you will be given a coupon to The Cornell Store for \$5 off the purchase of one Cornell clothing item. You will also be entered in a raffle for a chance to win one of two gift cards to The Cornell Store valued at \$100 and \$50, respectively. Your chances of winning this lottery will be one out of however many participants respond to this survey. If you are taking this survey in pencil-and-paper format, you will also be entered into the raffle and you will receive your coupon to The Cornell Store via email within the next few days.

Privacy/Confidentiality/Data Security

You will be asked questions which some may consider sensitive, but your privacy is important to us. Your information is to be kept confidential and only accessible to members of the research team. Please note that email communication is neither private, nor secure. Though we are taking precautions to protect your privacy, you should be aware that information sent through e-mail could be read by a third party. This consent form and associated data will be kept by the researcher for five years beyond the end of the study.

Taking part is voluntary

Your involvement in this research study is voluntary. You may refuse to participate before the study begins, discontinue at any time, or skip any questions/procedures that may make you feel uncomfortable with no penalty to you. You will be asked to re-consent at the beginning of each wave of the survey. Skipping questions and submitting partial data will not affect your chances at winning the raffle or receiving the offer from The Cornell Store at the end of the survey. Your participation (or non-participation) will have no effect on your relationship with the university.

If you have questions

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If you are in need of psychological services

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Statement of Consent

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- ☐ I do not wish to participate in this study (please exit the survey at this time)

Informed Consent

We are asking you to participate in Time 2 of a research study titled "The Cornell Experience Survey." We will describe this study to you and answer any of your questions.

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What the study is about

The purpose of this research is to explore how well-being and psychological development are shaped by college.

What we will ask you to do

We will ask you to complete a survey containing demographic questions (9) and 126 statements (for example, "I enjoy making plans for the future and working to make them a reality.") to which you will respond by rating how much you agree with each statement on a 1 (strongly disagree) to 5 (strongly agree) scale or similar. You will be invited via email to complete this survey a total of four times over the course of your year here at Cornell University. Since this survey is longitudinal, it is **not anonymous**; however, your name/NetID will be assigned a caseID to protect your anonymity to the best of our abilities. Each survey battery is expected to take you approximately 15 minutes to complete.

Risks and discomforts

We do not anticipate any risks from participating in this research; however, you may find some of the questions to be sensitive/personal. With this said, we anticipate that your participation in this survey presents no greater risk than everyday use of the Internet.

Benefits

You will not benefit directly for taking part in this research, besides learning more about how research is conducted. With regard to possible indirect benefits, reflecting over the course of your year could help foster a better sense of self-understanding. Furthermore, our understanding of development over college could be used to help develop intervention programs for people in the future.

Compensation for participation

For your participation in this research study, you will be given a coupon to The Cornell Store for 25% off the purchase of one Cornell-branded item. You will also be entered in a raffle for a chance to win one gift card to The Cornell Store valued at \$50. Your chances of winning this lottery will be one out of however many participants respond to this survey.

Privacy/Confidentiality/Data Security

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Cornell IRB
Amendment Approved: 8/4/16
Expires: 7/20/17

Page 1 of 2

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Benefits

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Compensation for participation

For your participation in this research study, you will be given a coupon to The Cornell Store for 25% off the purchase of one Cornell hooded sweatshirt. You will also be entered in a raffle for a chance to win one gift card to The Cornell Store valued at \$50. Your chances of winning this lottery will be one out of however many participants respond to this survey.

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Informed Consent

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Risks and discomforts

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Compensation for participation

For your participation in this research study, you will be given a coupon for 25% off an in-store purchase at The Cornell Store. You will also be entered into a raffle for a chance to win one gift card to The Cornell Store valued at \$100 or \$50. One \$100 and two \$50 gift cards will be given away during this raffle. You will be given an extra ticket in this raffle for every survey you responded to over the course of this academic year (maximum number of tickets: 4). Your chances of winning one of the three prizes offered during this lottery is dependent upon the number of people who respond to this installment, and the number of extra tickets each has garnered over the course of this study. **You must participate in the study at this time in order to be entered into the raffle at all.**

If you participated in all four surveys of this study, you will be entered into an additional raffle for gift cards to The Cornell Store. One \$100 and two \$50 gift cards will be given away during this bonus raffle. Your chances of winning this latter lottery will be one out of however many participants have also completed all four surveys of this study. It is possible, although highly unlikely, that you could win a prize from the raffle above *and* a prize from the bonus raffle.

Institutional Review Board Cornell University
Approved: April 6, 2017
Expires: July 20, 2017

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